University of Alberta

Creating Parliamentary Smoke: The Quest for a National Smoke Pollution Law in Nineteenth-Century England

by

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Abstract

In 1875, industrial smoke pollution provisions were enacted in the new English *Public Health Act*. Under the Act, excessive smoke emission was deemed a statutory nuisance. These provisions are remarkable for their resemblance in several aspects to pollution law currently in force in the United Kingdom as well as many other English-speaking countries. They are widely considered the key point of origin of modern atmospheric pollution legislation. However, the inclusion of smoke provisions in the 1875 *Public Health Act* followed more than a half-century of legislative activity in the area of smoke pollution that began with the passage of the 1821 *Smoke Prohibition Act*. There followed the enactment of numerous statutory smoke prohibitions in both local Acts of Parliament and more general Acts of national applicability. Repeated attempts to introduce a definitive national smoke prohibition were ultimately superseded by the statutory nuisance provisions incorporated in the 1875 *Public Health Act*.

This thesis traces nineteenth-century developments in smoke law up to the enactment of the 1875 *Public Health Act*. It argues that the 1875 Act was by no means the first serious attempt to fight industrial smoke pollution. Moreover, when viewed in relation to earlier legislatives initiatives in the area of smoke pollution control, the 1875 *Public Health Act* smoke pollution provisions in fact were notably conservative and regressive, and they compare unfavourably with earlier initiatives. The thesis thus challenges established historiographical interpretations of the smoke pollution provisions included in the 1875 *Public Health Act*, and it explores the many diverse influences that shaped the creation of

English smoke pollution law as it evolved over the nineteenth century. This allows the legal developments of this period to be viewed in a more dynamic way than is often allowed by historians, so that the constraints on, and opportunities for, the development of the body of law are shown to be numerous and to have originated from both internal legal changes as well as external historical influences.

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Introduction: Creating Parliamentary Smoke

> ...we are bidden by parliament to burn our own smoke: so I suppose, like good little children, we shall do as we are bid—some time.
>
> Mr. Thornton, in Elizabeth Gaskell, *North and South* (1855).

In 1875, industrial smoke pollution provisions were enacted in the new English *Public Health Act*. Under this Act, excessive smoke emission was deemed a statutory nuisance, and it became an indictable offence to operate,

> ...[any] fireplace or furnace which does not as far as practicable consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill factory dyehouse brewery bakehouse or gaswork, or in any manufacturing or trade process whatsoever; and any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance...[1]

Any such equipment could be declared a nuisance upon inspection by a local official and the owner or occupier fined unless he or she could prove that all means practicable had been attempted to avoid the creation of smoke pollution.

These provisions are remarkable for their resemblance in several aspects to pollution law currently in force in the United Kingdom as well as many other English-speaking countries. They are widely considered the key point of origin of modern atmospheric pollution legislation.[2] Over the nineteenth century, a body of statutory law was created to supplement the existing common law remedies used to control smoke pollution. Under the common law, smoke pollution was defined as a nuisance, against which legal action could be taken either by individuals or by local authorities. Each nuisance had to be prosecuted or litigated individually, and a judge or jury determined the penalties to be imposed. By contrast, statutory smoke provision offered a definition of polluting activities that constituted punishable offences, and imposed uniform standards on polluting factories that were enforced summarily. This was a profound change of approach to industrial smoke pollution control, and raises questions to the historian of how and from where did the 1875 smoke law emerge? What factors, people, and events inspired its creation? What legislation or other means of legal controls, if any, did it replace, and why?

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[1] *Public Health Act*, 1875, 38 & 39 Vict., c. 55, s. 91.*The Law Reports. The Public General Statutes*, vol. X, p. 375.

[2] For a discussion of this interpretation of the 1875 *Public Health Act* by numerous environmental, public health, and legal historians, see the introduction to Chapter Five below.

Smoke pollution provisions were incorporated into the 1875 *Public Health Act* because public health advocates took up the problem of smoke pollution in their attempts to combat the many grave risks to the public's health found to accompany the rapid urbanization of the nineteenth century. By mid-century, numerous public health problems had become sources of great anxiety to public health activists. Foremost were the cholera epidemics of 1831-1832 and 1848-1849 that brought the issue of sanitary reform to the forefront of public policy.[3] From the 1830s, public health advocates pursued disease prevention measures in response to the repeated epidemics of the first half of the century. The elimination of smoke pollution became one of the targets of their preventive action. Thus, while the relationship of industrial smoke pollution to the public health was not as explicitly clear as that of epidemic disease, poor sanitation, or derelict housing, smoke pollution was nonetheless made a national priority by public health activists seeking compulsory public health measures through legislation.

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[3] G. Kearns, "Cholera, Nuisances and Environmental Management in Islington, 1830-55", W. F. Bynum and Roy Porter, eds., *Living and Dying in London* (Medical History, Supplement No. 11) (London, 1991), pp. 94-95.

The development of English industrial smoke pollution legislation was not wholly due to the rise of the public health movement, however. Smoke pollution had been the subject of legislation long before the nineteenth century and the emergence of the public health movement. Statutory controls were applied to smoke emissions (along with other forms of pollution) repeatedly from the thirteenth century. In 1273, the burning of coal was banned in London and deemed "prejudicial to health".[4] In 1610, an Act prohibited the burning of various polluting fuels, and by the mid-seventeenth century the problem of coal smoke inspired John Evelyn to write his famous treatise *Fumifugium*.[5] Evelyn's pamphlet was reprinted in the 1770s, with mention made to several new industries said to require regulation due to their tendency to pollute.

It is therefore not surprising that several attempts were made to regulate industrial smoke pollution through legislation in the earlier nineteenth century, prior to the enactment of the 1875 *Public Health Act*. A smoke pollution clause was included in the *Health of Towns Bill* of 1848, which, with amendments, became the 1848 *Public Health Act* later that year (although the Act itself did not contain the clause).[6] In addition, a bill devoted exclusively to industrial smoke abatement was introduced in Parliament in the same year. It was withdrawn, however, when the *Health of Towns Bill* was drafted to include a smoke clause. The smoke bill was, in fact, one of a series of smoke abatement bills introduced beginning in 1843, and culminating in 1853 in the passage of a *Metropolitan Smoke Abatement Act*.[7] Although the 1853 Act applied only to London and the metropolitan area, the smoke abatement bills of the 1840s were national in scope. They, in turn, sought to replace a *Smoke Prohibition Act* of 1821, the first national industrial smoke pollution Act.[8] Moreover, the bills were modelled on smoke prohibition clauses that were included in numerous local improvement Acts (Acts of Parliament of local applicability) from the 1810s. Thus, the inclusion of smoke provisions in the 1875 *Public Health Act* followed more than a half-century of legislative activity in the area of smoke pollution.

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[4] A. Gilpin, *Environmental Economics: A critical overview* (Chichester, 2000), p. 118.
[5] The Act of 1610 is cited in J. Evelyn, *Fumifugium* (Oxford, 1930 [1772]), p. 39.
[6] *Public Health Act*, 1848, 11 & 12 Vict., c. 63.

This thesis explores those decades of activity and debate, beginning in the earliest years of the nineteenth century, and traces developments in the area of smoke law up to the enactment in 1875 of the new *Public Health Act* and its inclusion of statutory nuisance provisions covering industrial smoke pollution. It challenges the prevalent historiographical interpretation of the 1875 smoke provisions as the first meaningful legislative action taken against the growing problem of industrial smoke pollution. It will be seen that this Act was by no means the first serious attempt to fight industrial smoke pollution problems through legal means. Rather, its enactment followed the creation of many legislatives projects over the nineteenth century, all aimed at curbing industrial smoke pollution. Its provisions differed markedly from earlier attempts at such legislation. Moreover, when viewed in relation to earlier legislative initiatives in the area of smoke pollution control, the 1875 *Public Health Act* smoke pollution provisions in fact compare unfavourably with the earlier initiatives, and are notably conservative and regressive.

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[7] *An Act to abate the Nuisance arising from the Smoke of Furnaces in the Metropolis and from Steam Vessels above London Bridge*. 16 & 17 Vict. (1853), c. 128.

[8] *An Act for giving greater Facility in the Prosecution and Abatement of Nuisances arising from Furnaces used and in the working of Steam Engines*. 1 & 2 Geo. IV, c. 41 (1821).

To this end, this thesis examines several different approaches to the smoke problem adopted over this period, which are divided into a number of distinct, yet closely interconnected, phases of development. The first goal is to reveal the changing sources of influence that helped to shape the growth of English smoke pollution law, thus avoiding an overly narrow explanatory framework. Secondly, in looking at the smoke debate across this period of time, the thesis provides the historical and legal context necessary to offer the new assessment of the 1875 *Public Health Act* smoke provisions outlined above. It will be seen that the developments in English smoke pollution law over the nineteenth century occurred as they did as a result of a combination of internal and external factors. Internal legal historical factors included the relationship between the common law and statutory law, changing conceptions of the merits of legislation versus common law rules as tools to fight industrial pollution, and changing attitudes of judges, juries, and legislators toward industrial smoke pollution and pollution control. External factors included the accelerating scale and pace of industrialization and its environmental effects; evolving notions and patterns of central versus local power; changing industrial relations; and the development of technology and technical knowledge among legislators.

The approach taken in this thesis grew out of my assessment of the existing literature on this topic. Despite this long and varied history of English smoke pollution law in the nineteenth century, the remarkable survival of the 1875 smoke pollution provisions, in combination with the enactment of the first chemical pollution law, the *Alkali Act* of 1863, has led many historians to focus on the developments in this area of law which occurred only in the later nineteenth century.[9] Consequently, in the literature that touches on English environmental law in this period, the legislative events in question—the various laws and regulatory schemes that were attempted—have not been laid out comprehensively by any single scholar. Various writers identify a number of different Acts of Parliament as the putative point of origin of modern industrial pollution control, from the 1821 *Smoke Prohibition Act* right up to the 1875 *Public Health Act*, so that one is left wondering, first, which Act in fact constituted an origin of industrial pollution regulation and, secondly, whether indeed the search for such an origin within this time period is either justified or useful.

With respect to the first half of the nineteenth century, attempts to curb industrial pollution through statutory means are characterized by many historians as either wilfully ineffectual, due to a lack of will on the part of legislators to regulate industries seriously, or as severely inadequate given the rapid pace of industrialisation in the early nineteenth century and the lack of understanding of the composition of industrial pollution among both legislators and industrialists. In this regard, two historiographical discourses are predominant. First, many historians endorse a negative teleology in which legislators and industrialists are seen to have become hostile to environmental legislation as they developed laissez-faire economic policies. In this way, strict earlier rules concerning the protection of private property gradually gave way to new rules favouring industry and allowing pollution.[10] On the other hand, many others support a more positive teleology, arguing that in the early years of the industrial revolution, when unprecedented industrial pollution was only found in certain areas, most people were not aware of its full impact. In the later nineteenth century, as industrialisation progressed and with the rise of concern about disease, sanitation, water supplies and public health more generally, combined with increasing knowledge of the state of society derived from the new statistical movement, serious reform of the laws concerning pollution was undertaken and gradually grew into England's existing environmental law.[11] It is important to note that some studies do present a more balanced approach, such as the works of Peter Brimblecombe, Eric Ashby and Mary Anderson, who emphasize the inadequacy in early-nineteenth-century attempts to create smoke pollution legislation but, at the same time, point out the importance of the fact that such attempts were made at all.[12] However, the majority of historians seek to locate the developments in nineteenth-century English pollution law within a largely positive or negative interpretive framework.

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[9] For example, see A. R. Meetham, D. W. Bottom, S. Cayton, A. Henderson-Sellers, D. Chambers, *Atmospheric Pollution: Its History, Origins and Prevention*, 4th ed., (Oxford, 1981), pp. 207-208; B. W. Clapp, *An Environmental History of Britain since the Industrial Revolution* (London, 1994), p. 32; [9] R. Butterfield and J. Holroy, *Statutory Nuisance: A Guide for Professionals* (Sudbury, Suffolk, 2000), p. iii; R. McCracken et al., *Statutory Nuisance* (London, 2001), p. v; W. R. Hornby Steer, *The Law of Smoke Nuisances* (London, 1938), p. 10. As early as the mid-nineteenth century, commentators were discrediting the 1821 *Smoke Prohibition Act*. Industrial expert Charles Wye Williams wrote of the Act in 1857: "[it] need scarcely be observed that such power was not likely ever to be called in operation, and the Act consequently became a dead letter." C. W. Williams, *Prize Essay on the Prevention of the Smoke Nuisance* (London, 1857), p. 44.

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[10] For example, see F. Engels, *The Condition of the Working Class in England*, translated by W. O. Henderson and W. H. Chaloner (Oxford; 1958); L. Mumford, *Technics and Civilization* (New York, 1963 [1934]), ch. 4; B. W. Clapp, *An Environmental History of Britain since the Industrial Revolution* (London, 1994). On the unimpressive role played by political economists in Parliament, see F. W. Fetter, *The Economists in Parliament: 1780-1868* (Durham, NC, 1980), pp. 83-84. On the negative environmental consequences of industrialization and the rise of capitalism more generally, see T. Steinberg, *Down to Earth: Nature's Role in American History* (New York and Oxford, 2002), p. 55; T. Steinberg, *Nature Incorporated: Industrialization and the Waters of New England* (Cambridge and New York, 1991), p. 12; E. P. Thompson, *The Making of the English Working Class* (London, 1991 [1963]), p. 231. See also footnotes 6 and 7 below.

[11] For example, see A. Beck, "Some Aspects of the History of Anti-Pollution Legislation in England, 1819-1954", *Journal of the History of Medicine* (October, 1959), pp. 475-489; F. B. Smith, *The People's Health 1830-1910* (New York, 1979). On the relationship between the statistical movement and environmental law, see J. F. McEldowney and and S. McEldowney, *Environmental Law and Regulation* (London, 2001), ch. 2.

One discipline in which changes in environmental regulation in the industrial revolution period are examined at length, and in which the two interpretations outlined above are clearly articulated, is that of legal history, in particular the history of developments in private litigation through the common law of torts, in particular nuisance law. Joel Brenner and Morton Horowitz argue that from the early nineteenth century, English and American tort law was, in their view, manipulated by common law judges in order to favour industries and entrepreneurs.[13] They argue that a liberal "balance of equities" approach to common law decisions regarding the pollution of neighbouring lands replaced the absolute doctrine of *sic utere tuo* (under which landowners could only use their land in ways that did not damage neighbouring property, regardless of the social utility of their land usage). Consequently, actions for nuisance abatement declined, while suits seeking damages grew (so that the right to pollute essentially became available for purchase), and the possibility of successfully undertaking action against private nuisances declined, as courts imposed stricter requirements on plaintiffs and legislatures enacted statutes protecting industries from common law actions.

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[12] P. Brimblecombe, *The Big Smoke: A History of Air Pollution in London since Medieval Times* (London and New York, 1987), p. 101; E. Ashby and M. Anderson, *The Politics of Clean Air* (Oxford, 1981), p. 5.

[13] J. F. Brenner, "Nuisance Law and the Industrial Revolution", *Journal of Legal Studies* vol. 3, no. 2 (June 1974), pp. 403-433. M. J. Horowitz, *The Transformation of American Law, 1780-1860* (Cambridge, Massachusetts, 1977).

Horowitz and Brenner's works have sparked a lively debate about the nature of common law developments with respect to environmental protection in this period, which appears to remain largely unresolved.[14] It is very interesting to note that the most extensive work criticizing Horowitz's thesis, Peter Karsten's *Heart versus Head*, cites industrial pollution control as the one area in which Horowitz's thesis appears to be plausible. While Karsten argues, contrary to Horowitz, that in the case of other social issues relating to industrialisation early nineteenth-century American judges most often sided with the working poor rather than with industrialists, he admits that in the case of regulating industrial pollution there does appear to have been a bias among judges in favour of encouraging industry at the expense of the health of poor people both living and working near factories.[15]

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[14] For example, see D. R. Coquillette, "Mosses From an Old Manse: Another Look at Some Historic Property Cases About the Environment", *Cornell Law Review* vol. 64, no. 5 (June 1979), pp. 761-821. Among those opposed to the Horowitz thesis, see M. S. McBride, "Critical Legal History and Private Actions Against Public Nuisances, 1800-1865", *Columbia Journal of Law and Social Problems* vol. 22, no. 1 (1988), pp. 307-322 and P. Karsten, *Heart versus Head: Judge-Made Law in Nineteenth Century America* (Chapel Hill and London, 1997); R. Epstein, "The Social Consequences of Common Law Rules", *Harvard Law Review* vol. 95, no. 8 (June 1982), pp. 1717-1751. For an argument in favour of the adoption by common law judges of a balance of equities approach, see R. Posner, *The Economic Analysis of Law* (Boston, Little and Brown, 4th ed. 1992). For some different approaches, see J. P. S. McLaren, "Nuisance Law and the Industrial Revolution – Some Lessons from Social History", *Oxford Journal of Legal Studies* vol. 3, no. 2 (1983), pp. 155-221; C. Rosen, "Differing Perceptions of the Value of Pollution Abatement, 1840-1906" *Law and History Review*, vol. 11 (1993); D. M. *Provine*, "Balancing Pollution and Property Rights: a Comparison of the Deveopment of English and American Nuisance Law", *Anglo-American Law Review* 7 (1978).

[15] Karsten, *Heart versus Head*, p. 135. Karsten points out that as factories grew bigger, employing more people and using larger machinery, it became much more difficult to force them to move. He argues that it in fact did not make sense to move factories because of the social good they provided through jobs and taxes: "Could one, in all justice, read preindustrial precedent in such a way as to shut such a factory down simply because it had done fifty or sixty dollars in annual damage to a

Moreover, several of these scholars, in particular Richard Epstein and John McLaren, have argued that a full picture of the development of environmental policy in this period cannot be obtained from the study of common law litigation alone. Epstein argues that the common law is inherently a conservative entity, designed to maintain social order, and thus cannot be considered as an innovative force fostering social change, while McLaren argues that private litigation should be studied in conjunction with concurrent legislation, "private ordering" schemes (such as arbitration or voluntary agreements), and social dynamics such as attitudes towards governmental involvement in economic matters. Alternatively, some of the essays in Lowry and Edmunds's *Environmental Protection and the Common Law* look to internal developments facing common law judges in the nineteenth century, such as the end of mandatory trials by jury in the 1850s, as factors affecting their decisions too.[16] In addition, economists emphasize the fact that the balancing of the costs and benefits by judges does not inevitably result in socially regressive policy formation. Rather, balancing is an essential aspect of all forms of pollution control policy as judges seek to reach an optimal pollution point.[17] The question that presents itself to the historian is how such a balancing process developed over time. Historian Christine Rosen asserts that a historical perspective is crucial to the investigations of judicial decisions in legal actions involving pollution problems.

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neighboring farmer's orchards or crops? Here, certainly, was proper material for judicial cost-benefit analysis."

[16] J. Lowry and R. Edmunds, eds. *Environmental Protection and the Common Law* (Oxford and Chapel Hill, 2000). For discussion of the end of mandatory trials by jury for civil cases in 1854, see Raymond Cock's essay, "Victorian Foundations?", pp. 1-25.

[17] For example, see M. L. Cropper and W. E. Oates, "Environmental Economics: A Survey", *Journal of Economic Literature*, vol. 30 (June 1992), p. 729.

This is because the question of what factors judges deem to be costs and benefits varies over time.[18]

As a whole, these studies in the legal environmental history of the industrial revolution period provide much important evidence concerning the development of pollution law in the nineteenth century. Moreover, the work of Epstein, McLaren, Rosen and other scholars who point out the shortcomings of the research done in this area offers valuable points for further research. In particular, this thesis will analyse developments in public and private nuisance law, other forms of local enforcement of environmental standards, and national statutory law in their historical context in the attempt to broaden the existing picture of the evolution of English pollution law in the nineteenth century.

Several recent studies have shed light on some of the action taken with respect to industrial smoke pollution in the first half of the nineteenth century in a number of interesting ways, yet lack a large enough chronological scope to encompass the nineteenth-century smoke debate. For example, Catherine Bowler and Peter Brimblecombe emphasise the importance of local governmental initiatives to control smoke pollution prior to the enactment of the 1875 *Public Health Act*. They argue that in spite of the lack of success at the central level in enacting national smoke abatement law and the difficulties encountered in enforcing the laws that did exist, local authorities in Manchester consistently fought to reduce smoke pollution.[19] Peter Thorsheim describes the efforts made in the nineteenth century to use gas and coke—considered "smokeless fuels"—in populated areas, and the resulting negative environmental effects arising from the building of gas and coking facilities in more remote areas.[20] Alternatively, Chris Otter argues that nineteenth-century attempts to control industrial smoke pollution were part of a larger project of "liberal governmentality".[21] Otter draws upon the concept of "visuality" and its intricate link to liberalism to argue that full subjects of a liberal civil society were required to discipline and regulate themselves through the knowledge that their actions were visible and open to the scrutiny of those around them. Smoke pollution contributed to the "miasmatic, dark atmosphere" that made such a liberal society impossible; therefore, attempts were made to reduce the "dense veil of smoke", through which the "civil conduct of the respectable could not be seen and emulated."[22] These findings reveal the importance of the attempts at smoke pollution control made in the early nineteenth century; however, they remain to be connected to the legislative attempts of the period 1821-1875 in order to provide a fuller view of the quest to create a national smoke pollution law.

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[18] C. Rosen, "Differing Perceptions of the Value of Pollution Abatement across Time and Place: Balancing Doctrine in Pollution Nuisance Law, 1840-1906", *Law and History Review*, vol. 11, no. 2 (fall 1993), pp. 303-381.

This thesis will build upon the research outlined above and will provide both a fuller picture and a new interpretation of the quest to create a national smoke pollution law over the course of the nineteenth century. As noted above, most historians of this topic tend either to ignore or dismiss the importance of early nineteenth-century anti-pollution initiatives. By contrast, I will argue that the *Public Health Act*, 1875, in fact marked the disappointing end of a vibrant and important series of attempts to enact anti-smoke pollution law that began in 1819. In these early years, numerous prominent industrialists agreed with and actively supported those members of Parliament who initiated anti-smoke pollution legislation. This agreement led to the smooth passage of the 1821 *Smoke Prohibition Act*. For several decades after 1821, legislation of both local and central inspiration was put forward in the effort to further control industrial smoke pollution. The legislative philosophy informing the bills and Acts throughout this period reflected a belief in the practicability of imposing general smoke pollution prohibitions and the possibility of largely eradicating smoke pollution. However, by 1875, this period of opportunity was gradually eclipsed as the determination evident among the early advocates of smoke abatement legislation declined and strict smoke provisions became progressively less acceptable to an increasingly wide range of people, including legislators and industrialists. Consequently, the smoke provisions incorporated into the 1875 *Public Health Act* were remarkably conservative by comparison with earlier legislation.

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[19] C. Bowler and P. Brimblecombe, "Control of Air Pollution in Manchester Prior to 1875", *Environment and History*, vol. 6, no. 1 (Feb. 2000), pp.71-98.
[20] P. Thorsheim, "The Paradox of Smokeless Fuels: Gas, Coke, and the Environment in Britain, 1813-1949", *Environment and History*, vol. 8, no. 4 (Nov. 2002), pp. 381-401.
[21] C. Otter, "Making liberalism durable: vision and civility in the late Victorian city", *Social History*, vol. 27, no. 1 (January 2002), p. 1.
[22] C. Otter, "Making liberalism durable: vision and civility in the late Victorian city", pp. 2, 3.

Chapter One provides an overview of the established legal procedures that were used to combat industrial pollution in the very early industrial revolution period. It will examine various aspects of common law nuisance, the predominant legal means employed to combat pollution problems prior to the enactment of statutory smoke provisions. These included local indictments and prosecutions from several different local jurisdictions in which I conducted archival research;

appeals of such actions to common law courts; and private nuisance suits. It will then discuss the ways in which common law remedies were used to combat the new and unprecedented levels of smoke pollution that accompanied industrialization.

The common law system of pollution control laid out in Chapter One will be discussed further in Chapter Two. This chapter examines the 1821 *Smoke Prohibition Act*. Many historians dismiss this Act as largely useless, serving only, as Brian Clapp argues, "…to state that Parliament was against smoke, rather than for it."[23] This is because the purpose of the 1821 *Smoke Prohibition Act* was to uphold and strengthen the common law conception of smoke pollution as a nuisance. Because the remedies available at common law eventually became inadequate in the face of rapid industrialization and changes in local government, the Act is seen as largely obsolete from its inception. However, this chapter will reveal that the threat of indictments and/or nuisance suits in some instances served as a powerful tool for local authorities and individual community members seeking to force industrialists to alter their practices. The strength of common law rules and remedies in this period, as well as their perceived success in the earliest cases of severe industrial pollution provide important context for the creation of the 1821 *Smoke Prohibition Act*. They led legislators to enact a law upholding what they perceived to be a largely adequate pollution control regime.

In addition, with the enactment of the 1821 Act, a national law devoted solely to industrial smoke pollution was created—something that would not be achieved again until the mid-twentieth century. The creation of the Act received the support of many prominent industrialists, many of whom had voluntarily adopted smoke abatement technologies. They were optimistic that industrial smoke could be eliminated and that significant savings of fuel could be realized as a result of their investment in clean-burning equipment. As a whole, the chapter will provide a more positive interpretation of the 1821 Act than that found in existing literature. It also provides important background to subsequent legislative attempts of the later nineteenth century.

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[23] B. W. Clapp, *Environmental History of Britain*, p. 32.

Additionally to the merits of the 1821 Act itself, the question arises of the merits of the choice to pursue legislation in order to control industrial pollution. In developing a body of statutory law aimed at controlling industrial smoke pollution, English legislators created a pattern that has been followed around the world ever since.[24] Today, however, many economists object to statutory regulation of pollution emissions. The universality of such measures is viewed as unfair because it will always be more difficult for some firms than for others to prevent the creation of pollution.[25] The fines are often too low, and enforcement is often weak.[26] In addition, statutory regulation is characterized as "static" and lacking in incentives for polluters to cease polluting. Once articulated in statutory form, regulations are considered likely to become stagnant, "not likely to evolve rapidly", and are assumed to become quickly obsolete due to the length of time required to enact legislation. As Henk Folmer and H. Landis Gabel explain, "… technical progress will become embodied in new regulations and standards only after a long time."[27]

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[24] As Alan Gilpin explains, statutory regulation through legislation became "the normal approach to pollution control and environment protection throughout history". A. Gilpin, *Environmental Economics: A critical overview* (Chichester, 2000), p. 113.
[25] R. Mendelsohn, "Environmental Economics and Human Health", *Environmental Health Perspectives* vol. 110, issue 3 (March 2002), p. A 118.
[26] H. Folmer and H. Landis Gabel, *Principles of Environmental and Resource Economics: A Guide for Students and Decision-Makers*, 2nd Edition (Cheltenham, 2000), pp. 163-164; D. W. Pearce and R. K. Turner, *Economics of Natural Resources and the Environment* (Baltimore, 1990), pp. 102-104.

Instead of direct regulation through legislation, economists propose a variety of measures called "economic instruments".[28] These include taxes on pollution emissions[29], subsidies for firms that adopt cleaner technologies[30], and marketable emissions permits that impose pollution quotas that firms can buy or sell depending on their needs and ability to abate their pollution.[31] Additionally, some economists advocate a return to the exclusive usage of common law remedies. Such economists emphasize the importance of enforcing property rights, so that neighbouring property owners will negotiate with one another in order to achieve an optimal level of pollution and pollution control.[32]

Such criticisms of pollution regulation through legislation are unfairly applied to the early nineteenth century, however. To begin with, many economists recognize that legislation is often necessary, despite its inefficiencies. Even economic instruments require legislation governing them.[33] In addition, in the early nineteenth century, the various alternatives to legislation that are advocated today were not viable options given the existing governmental powers and infrastructure. By contrast, legislation was a viable option and was considered a workable tool for achieving significant change. This thesis argues that the legislative attempts made in the first half of the nineteenth century were in fact serious attempts to take anti-pollution measures that reflected a genuine desire among numerous legislators as well as sympathetic industrialists to help England's process of industrialization to proceed in an environmentally sound fashion. The fact that they chose legislation reflects the options available to them, as legislators, and reflects their decision to exercise those options in a manner that was environmentally proactive. Finally, the fact that it was often difficult to achieve a legislative enactment due to frequent lack of willingness among members of Parliament to participate in the legislative process further emphasizes the extent of the achievement in 1821.[34]

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[27] H. Folmer and H. Landis Gabel, *Principles of Environmental and Resource Economics: A Guide for Students and Decision-Makers*, p. 164.

[28] A. Gilpin, *Environmental Economics: A critical overview* (Chichester, 2000), ch. 6.

[29] D. W. Pearce and R. K. Turner, *Economics of Natural Resources and the Environment* (Baltimore, 1990), pp. 104-107.

[30] Gilpin, *Environmental Economics*, pp. 150-152.

[31] R. Mendelsohn, "Environmental Economics and Human Health", *Environmental Health Perspectives*, vol. 110, issue 3 (March 2002), p. A 118. Mendelsohn argues that tradable emissions permits are now viewed as the favoured option by economists.

[32] This approach was first articulated by Ronald Coase in 1960, and is often called the Coasian approach. R. H. Coase, "The Problem of Social Cost", *Journal of Law and Economics*, vol. 2 (October 1960), pp. 1-44.

[33] For example, see A. *Gilpin, Environmental Economics* (Chichester, 2000), p. 138.

Witnesses testifying before parliamentary committees of 1819 and 1820 noted the acceleration of industrialization and urbanization occurring before them. As the century progressed, this unprecedented growth gradually helped to make the enforcement of the accepted environmental standards embodied in common law nuisance rules (and thus also the 1821 *Smoke Prohibition Act* which upheld the common law approach to pollution control) increasingly difficult to enforce. By the 1840s, the inadequacy of common law procedures was cited by legislators as a primary justification for the creation of a new national smoke law. The problems associated with rapid industrialization that affected pollution control are discussed again in Chapter Five. Chapter Three examines a different problem that also undermined the effectiveness of common law remedies: the decline of local Courts of Quarter Session as a venue for nuisance proceedings. The decreasing incidence and effectiveness of nuisance indictments was related to the decline of the Courts of Quarter Session, which occurred as urbanization escalated and town government changed in the 1830s.

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[34] D. Lieberman, *The Province of Legislation Determined* (Cambridge, 1989), introduction, esp. p. 21.

In addition, the chapter demonstrates that the response by local authorities to this decline proved equally important in the smoke pollution debate. As the Quarter Sessions lost many of their powers, local governments turned increasingly to local improvement Acts to provide them with powers to regulate a wide range of environmental problems. Such Acts were a form of legislation that had long been used to legislate many different local improvements but had not, until this point, included industrial smoke pollution provisions. Through this local legislation, a significant change of approach to the pollution problem was articulated, from reactive common law actions to the use of a proactive smoke prohibition. The extent and importance of this change of approach is also analyzed in this chapter.

Part of the new approach to smoke pollution legislation taken in the local improvement Acts was their inclusion of a "best practicable means" clause. The local improvement Acts contained the first statutory articulations of the "best practicable means" clause. The Acts imposed prohibitions on industrial smoke emissions, and then required steam engine and furnace owners to employ the best means known to exist to prevent or eradicate their smoke emissions. The "best practicable means" clause and ones very similar to it remain in use today in the pollution laws of many different countries, and are considered by many historians and legal scholars as excessively ambiguous and thus largely unworkable. Such an assessment of the clause has led several historians to view the use of such a clause in negative terms from its very beginnings. However, Chapter Three argues that in the early nineteenth century, the "best practicable means" clause in fact was used proactively, as a requirement forcing polluters to prove that they had used all means possible to avoid emitting excessive amounts of smoke. This helped make the earliest smoke prohibitions practicable as it removed the possibility of their easily being rendered unenforceable on technological grounds. As will be seen in Chapter Five, only in later decades did the "best practicable means" clause become worded explicitly as a defence, providing an easy loophole for polluters seeking to avoid living up to the spirit of anti-smoke pollution legislation.

The merits of the use of statutory pollution prohibitions and the use of a "best practicable means" clause and ones similar to it remain controversial because of the continued use of such clauses in pollution legislation. The goal of regulations requiring pollution prevention or elimination is the total eradication of pollution. This zero pollution approach is rejected by many economists and deemed unrealistic and unworkable. Maureen Cropper and Wallace Oates, for example, dismiss the zero pollution approach as "purist" and argue that it needs to be replaced by "a realistic consideration of the design and implementation of policy measures."[35] One such consideration is the level of technological capability in existence at the time of the imposition of an environmental standard through statutory regulation. Either the technological capability must exist to fully meet the standard, or the regulation must contain a clause establishing that the standard is to be met as fully as the current state of technology allows. As Folmer and Gabel explain, "[s]tandards will usually be enforceable to the extent that technical possibilities exist or are likely to be developed. This is why environmental regulations often refer to concepts such as 'best available technology' (BAT) or 'best practicable means' (BPM)."[36]

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[35] M. L. Cropper and W. E. Oates, "Environmental Economics: A Survey", *Journal of Economic Literature*, vol. 30 (June 1992), pp. 675-740.

However, as a goal zero pollution can be valuable. For example, the United States Environmental Protection Agency sets a goal of preventing pollution (i.e. stopping pollution before it is created, thus leading to zero pollution). Yet in seeking to meet that goal, it prescribes best practices for a wide variety of industrial activities, offering realistic and feasible options for industries to pursue.[37] The local improvement Acts incorporated such an approach in their imposition of statutory smoke prohibitions. By requiring factory owners to eliminate their smoke, within the parameters of the best means known to exist to do so, legislators laid out complete pollution elimination as a goal, but allowed room for flexibility so that the law could remain workable given the technological uncertainty surrounding smoke prevention and eradication.

The decision of several local governments to pursue statutory smoke prohibitions through local improvement Acts had important implications at the central level of government. Chapter Four reveals the influential role played by the statutory smoke provisions of local applicability in the mid-nineteenth-century quest to create a national smoke law. In the 1840s, central legislators sought to enact a new national smoke abatement law, one that no longer rested on common law nuisance procedures, which had been the predominant means for controlling pollution for centuries. Instead, they sought to create a stricter, more impartial smoke law that would force industrialists to alter their equipment from the outset rather than forcing them to do so only upon the successful undertaking of nuisance actions against them. In their attempts to create a substantively new smoke law, legislators drew upon the local smoke prohibition clauses embodied in local improvement Acts in the previous decades. Their activity in this area received much support from the public as well as the leaders of the new public health movement. Their quest to create a definitive national Act in the place of the many local Acts in force by this time was in keeping with the growing emphasis, in the 1840s and 1850s, on national, compulsory legislation as the optimal means of fostering progressive social change.

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[36] H. Folmer and H. Landis Gabel, *Principles of Environmental and Resource Economics: A Guide for Students and Decision-Makers*, pp. 160-161.

[37] The US EPA advocates striving for the prevention (and thereby complete elimination) of pollution, but recognises that this is not always possible. Thus it has developed "best management practices" to help firms work toward pollution prevention. "Best management practices are methods that have been determined to be the most effective and practical means of preventing or reducing pollution." Available at: http://www.epa.gov/ebtpages/pollbestmanagementpractices.html (21 July 2005). See also A. Gilpin, *Environmental Economics* (Chichester, 2000), pp. 111-115.

Despite over a decade of attempts to create a new national smoke law, these attempts culminated in the passage of an Act of greatly limited geographic scope, the 1853 *Metropolitan Smoke Abatement Act*. This Act did, at least, impose a general smoke prohibition on the metropolitan area. However, it was not followed by a similar Act of national scope. Instead, the smoke provisions found in the 1875 *Public Health Act* formed the final outcome of the nineteenth-century smoke debate. Chapter Five is devoted to the 1875 smoke provisions, and emphasizes their highly conservative and regressive nature in light of the far bolder earlier attempts made to control industrial smoke pollution by legal means.

These changes stemmed from the melding of smoke abatement clauses, nuisance removal law and public health initiatives, as well as from the reinterpretation of a number of concepts and clauses integral to smoke pollution legislation since the early nineteenth century in a more conservative fashion favouring and protecting industrial polluters. Industrial smoke pollution provisions were inserted into clauses relating to nuisances and nuisance removal, so that they no longer constituted a smoke prohibition. Instead, smoke pollution was deemed a potential nuisance, and summary action was laid out for dealing with such nuisances upon their creation and detection.

In addition to the rewording of the 1875 smoke provisions in a more reactive and weak manner than the smoke prohibitions of the mid-nineteenth century, it became increasingly unlikely that the 1875 smoke provisions would be interpreted strictly and used to greatly reduce industrial smoke pollution. This was due, first, to the inclusion in the provisions of a "best practicable means" clause that was now explicitly worded as a defence for polluters. The clause thus served to further weaken smoke provisions that were already afforded significant room for judicial interpretation and discretion. Secondly, conceptions of "reasonableness" with respect to the nature and location of industrial activity and of the rights and responsibilities of factory owners versus their workers were re-interpreted in a manner favourable to industrial polluters.

When viewed in this context, and in relation to the developments outlined in the earlier chapters, a new interpretation of the 1875 *Public Health Act* smoke provisions emerges. While the importance of this Act as a key point of origin for modern environmental law remains undisputed, in terms of industrial smoke pollution its novelty and innovativeness are brought into question as it becomes clear that the Act offered a conservative, disappointing body of law.

As a whole, this thesis examines several distinct phases in the development of English smoke pollution law. At the same time, it reveals the interconnections between the successive attempts made to create robust smoke law. The object is to move away from the established historiographical interpretations of this topic and to explore a wider variety of explanatory factors across a longer chronological period. The examination of different stages of the smoke debate in their respective historical contexts makes it possible to challenge conventional interpretations of the smoke provisions incorporated in the 1875 *Public Health Act*. In addition, by revealing the links between the various stages of development, the thesis will demonstrate that many diverse influences shaped the creation of English smoke pollution law as it evolved over the nineteenth century. This allows the legal developments of this period to be viewed in a more dynamic way than is often allowed by historians, so that the constraints on, and opportunities for, the development of the law are shown to be numerous and to have originated from both internal legal changes as well as external historical influences.

Chapter 1. Pollution Control at the Outset of Industrialization

> That this Glorious and Antient City, which from Wood might be rendered Brick, and (like another Rome) from Brick made Stone and Marble; which commands the Proud Ocean to the Indies, and reaches the farthest Antipodes, should wrap her stately head in Clowds of Smoake and Sulphur, so full of Stink and Darknesse, I deplore with just Indignation.
>
> John Evelyn (referring to London), *Fumifugium*, 1661.

Introduction

This chapter will provide an overview of the established legal procedures that were used to combat industrial pollution in the very early industrial revolution period. It is intended to provide a historical background for understanding the circumstances in which the *Smoke Prohibition Act* of 1821 was enacted. The pollution control regime of this early period will then be compared and contrasted with the very different sets of circumstances prevailing in the mid- and later nineteenth centuries.

The chapter will begin with an account of the historical development of nuisance law within the common law, in order to provide several key aspects of the thesis. First, it will present an introduction to the concepts and terminology enshrined in common law nuisance. Secondly, it will emphasise the extent to which nuisance law served as the predominant form of smoke pollution control in pre-industrial England. Finally, it will demonstrate the manner in which the common law regime was adapted in the attempt to meet the needs of England's emerging industrial economy with respect to pollution control.

To this end, the present chapter will examine specific examples of the three forms of legal actions that comprised common law nuisance: local indictments and prosecutions from the five different local jurisdictions taken as case studies; appeals of such actions to common law courts; and private nuisance suits.

The development of industrialization prompted increasing resort to public nuisance indictments by local authorities attempting to curb the unprecedented pollution levels created as steam power allowed industrialists to set up factories in urban areas (rather than on isolated rural watercourses, in forests where wood for charcoal was available, etc.). The chapter will show that persons with a legal interest in property, as owners or occupiers of industrial premises or of neighbouring land, used common law actions on a relatively regular basis in efforts to curb the negative effects of industrial smoke. It was in this period, in which common law remedies were perceived as a relatively successful means of curbing industrial smoke pollution, that the 1821 *Smoke Prohibition Act* was conceived and enacted.

Background

Industrial atmospheric pollution long predated the industrial revolution in England. So too did awareness of the negative effects of such pollution. The use of coal fuel first became common in London from the late thirteenth century, likely due to the rising price of wood in response to its growing scarcity as England's population had grown rapidly between the eleventh and thirteenth centuries.[1] Throughout the middle ages, several attempts were made to control coal smoke through royal proclamations and legislation. Other types of fuels were also found to be problematic with respect to pollution, to such an extent that in 1610, an Act of James I banned the burning of "Ling, and Heath, and other Moor-burning" (small shrubs) for use as fuel. The preamble stated that as a result of this practice,

> …by the multitude of grosse vapours, and Clouds arising from those great Fires, the Aer is so distemper'd, and such unseasonable and unnatural storms are ingendered, as that the Corn, and the Fruites of the Earth are thereby in divers places blasted, and greatly hindered in their due course of ripening and reaping.[2]

By the seventeenth century, coal was becoming the predominant form of fuel in much of London, replacing wood, charcoal, and other organic fuels. As in the late thirteenth century, coal was again resorted to as wood became increasingly scarce in the city during the Tudor period.[3] In May, 1661, John Evelyn, a founding member of the Royal Society, decried the suffocating smoky atmosphere of London in his pamphlet, *Fumifugium*. Evelyn singled out the burning of sea-coal in industrial furnaces as the greatest smoke pollution plaguing London. The worst pollution, he asserted, came from industrial premises, "some few particular Funnels and Issues, belonging only to Brewers, Diers, Lime-burners, Salt, and Sope-boylers, and some other private Trades, One of whose Spiracles alone, does manifestly infect the Aer, more than all the Chimnies of London put together besides…"[4] The smoke emitted by these industries defaced the buildings of London and endangered and shortened the lives of the city's inhabitants. Evelyn proposed a plan requiring such polluting trades to be practised outside the city centre. The objective was to render the city of London cleaner and more easily habitable, and, as Evelyn described, to "render not only Your Majesties Palace, but the whole City likewise, one of the sweetest, and most delicious Habitations in the World…"[5]

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[1] P. Brimblecombe, *The Big Smoke: A History of Air Pollution in London since Medieval Times* (London and New York, 1987), pp. 16-18. W. R. H. Steer, *The Law of Smoke Nuisances* (London, 1938), p. 10.

[2] Cited in J. Evelyn, *Fumifugium* , (Oxford, 1930 [1772]), p. 39.

[3] Brimblecombe, *The Big Smoke*, pp. 29-30.

Evelyn's pamphlet was reprinted in 1772. The anonymous publisher praised Evelyn's plans and called for the inclusion of several new industries in them, emphasising the polluting and destructive nature of their practices:

> Our Author expresses himself with proper warmth and indignation against the absurd policy of allowing Brewers, Dyers, Soap-boilers and Lime-burners to intermix their noisome works amongst the dwelling-houses in the City and Suburbs: But since his time we have a great increase of Glass-houses, Founderies, and Sugar-bakers to add to the black catalogue; at the head of which must be placed the Fire-engines of the Water-works at London Bridge and York Buildings, which (whilst they are working) leave the astonished spectator at a loss to determine whether they do not tend to poison and destroy more of the inhabitants by their Smoke and Stench than they supply with their Water.[6]

Similar proposals were made throughout the eighteenth century. In 1715, for instance, another member of the Royal Society, Jean-Theophile Desaguliers, translated a French treatise entitled *Fires Improved.*[7] This offered practical instructions for workmen responsible for managing furnaces, and was reprinted in

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[4] J. Evelyn, *Fumifugium* , p. 19.

[5] J. Evelyn, *Fumifugium* , p. 3.

[6] J. Evelyn, *Fumifugium*, "Preface by the Editor" (anonymous), pp. iii-iv.

[7] N. Gauger. *Fires improv'd: being a new method of building chimneys, so as to prevent their smoaking: ... Written in French, by Monsieur Gauger: made English and improved, by J. T. Desaguliers, ... By whom is added, the manner of making coal-fires, as useful this new-way, as the wood-fires propos'd by the French author, ...* (London, 1715). *Eighteenth Century Collections Online*. Gale Group. http://galenet.galegroup.com.login.ezproxy.library.ualberta.ca/servlet/ECCO (5 May 2005).

English several times during the eighteenth century. During the eighteenth century, the problem of smoke pollution grew increasingly severe as industrial growth accelerated and the fundamental changes in industrial practices required for full industrialization took root. As I. G. Simmons explains, it was in this century that the gradual shift from an "organic economy" to an "industrial economy" began in England.[8] In response, by the turn of the nineteenth century numerous industrialists attempted to solve the problem of smoke pollution. They altered their machinery in order to improve its efficiency and reduce the waste of fuel that accompanied the excessive creation of smoke. Foremost among these industrialists was James Watt, who, in 1785, invented a furnace designed to consume, or burn, its own smoke by injecting additional amounts of air into the furnace and onto the fire.[9] Numerous such inventions were advertised in *The Times* newspaper by the early nineteenth century. Competition among inventors can be seen in an advertisement from 1817, in which a "Surveyor of Chimneys" asserted that he, "…respectfully acquaints the Nobility, Gentry, &c., that he removes the various causes of the nuisance of smoke, where cauls, smoke dispensers, aperture pipes, and many other devices fail …"[10]

Despite the growing awareness of smoke pollution and its harmful effects, however, the legal remedies available continued to be those attached to nuisance law and which had been in use for centuries. As will be shown in the following sections, until 1821 industrial smoke pollution was contended with through established legal rules, rather than being treated exceptionally as a form of pollution requiring unique legal remedies.

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[8] I. G. Simmons, *An Environmental History of Great Britain From 10,000 Years Ago to the Present* (Edinburgh, 2001), p. 146.

[9] R. B. Prosser, *Birmingham Inventors and Inventions: Being a Contribution to the Industrial History of Birmingham* (Trowbridge and London, 1970 [1881]), pp. 35-36. See also B. Marsden, *Watt's Perfect Engine: Steam and the Age of Invention* (Cambridge, 2002), passim.

[10] *The Times*, 27 December, 1817, pg. 4, col. A.

History of nuisance law

In the eighteenth century, smoke pollution was dealt with through common law procedures and was treated as either a private nuisance or a public nuisance. Nuisance is a particularly ancient form of common law action. Its origins lie in the medieval assizes of buildings and nuisances. The London assize of buildings is thought to have emerged from a set of fire regulations written between 1192-3 and 1212. The assize contained detailed regulations for "walls, gutters, privies, windows, and pavements".[11] The assize of nuisance evolved from the writ of novel disseisin, under which a freeholder could be disseised of the part of his tenement causing a nuisance since the nuisance was considered to be "ad nocumentum liberi tenementi" (to the damage or detriment of the free holding of a tenement).[12] By the thirteenth century, the assize of nuisance "concerned the making or removal of ditches, pools, hedges, the diversion of water-courses and the obstruction of ways" and such nuisances were heard before justices of assize.[13] Defendants could be fined, ordered to remove or abate the nuisance, or both. In this way, a landowner could protect his or her property by requiring one's neighbours to avoid using their property in a way that caused unreasonable damage to his or her land, house, animals, etc.

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[11] H. M. Chew and W. Kellaway, eds. *London Assize of Nuisance 1301-1431* (London, 1973), p. xx.
[12] H. M. Chew and W. Kellaway, eds., *London Assize of Nuisance*, p. xii.
[13] H. M. Chew and W. Kellaway, eds., *London Assize of Nuisance*, p. xiii.

It was also in the middle ages that local authorities were given powers to enforce public nuisance law, for cases in which a landowner conducted activities on his or her property that not only damaged the property of his or her neighbours, but that harmed the public's health as a whole. The identification of the local authorities as the bodies responsible for enforcing this nuisance law derived from an Act of 12 Richard II, cap. 13 (1388). This statute required mayors and bailiffs to order polluters to either fix the problems they had created or face a £20 fine. The following reason for enacting the statute was given in its preamble:

> Item, For that so much dung and filth of the garbage and intrails as well of beasts killed, as of other corruptions, be cast and put in ditches, rivers, and other waters, and also within many other places, within, about, and nigh unto divers cities, borough, and towns of the realm, and the suburbs of them, that the air there is greatly corrupt and infect, and many maladies and other intolerable diseases do daily happen, as well to the inhabitants, and those that are conversant in the said cities, boroughs, towns and suburbs, as to other repairing and travelling thither, to the great annoyance, damage, and peril of the inhabitants, dwellers, repairers, and travellers aforesaid …[14]

Although private nuisances are injuries committed by a private individual against another individual, and this therefore does not immediately appear to be an explicitly "environmental" area of law, under private nuisance law some very interesting conceptions of the physical world and its relationship to humans developed over time. For example, in the 1630s a lawyer discussing a case in which some of the windows of a man's house were encroached upon when his neighbour built a house that was tall enough that it obstructed the natural light previously enjoyed by the man asserted that, "though light and ayre be common, yet if by any mans owne act they may bee made private, they may not then bee taken from him, and if they be, he shall not be without remedy."[15]

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[14] *[An Act for] The punishment of them which cause corruption near a city or great town to corrupt the air.* 12 Richard II, c. 13 (1388).

Public nuisance law also contained a number of actions, from its very beginnings, that would be deemed "environmental" today. In the middle ages, indictments were common for altering watercourses, neglecting to pave roads, purpresture (illegal encroachment onto private or public land) or "encroachments upon the king's highway" so that it was difficult to pass along "the king's highway, streets, lanes, paths or waterways", ruinous houses, and some nuisances relating to industry, such as a forge being built in a public street and thereby obstructing the street.[16]

Nuisance law remained largely unchanged into the late eighteenth century. It was still divided into private nuisances (which were civil in nature) and public nuisances (criminal in nature), still administered at the local level, and designed to protect the property of the victims of nuisances by requiring landowners to use their property in a way that did not unreasonably damage their neighbours' property or harm the public at large. Furthermore, in both private and public nuisance actions, the decision as to whether a nuisance had occurred or not remained with a judge or jury, who considered such factors as the location of the polluting firm, the care taken by the polluter to avoid polluting, and the public benefit derived from the existence of a polluting firm. In other words, courts exercised significant discretion in determining nuisance cases because a nuisance was not just an action alone, but was inherently relative to someone else.

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[15] *A Briefe Declaration for What manner of speciall Nusance concerning private dwelling Houses, a man may have his remedy by Assise, or other Action as the Case requires* (London, 1636), p. 2.
[16] Ibid., pp. xxvii-xxvii.

Therefore, a person who committed a smoke nuisance could either be sued by another individual(s) for a private, or indicted by local authorities through a grand jury for a public nuisance which affected the wider community as a whole. For example, in 1757 a renowned sulphuric acid manufacturer, Joseph Ward, was indicted for conducting an industrial process "whereby … noisome and offensive stinks and smells" were emitted.[17] Many nuisance presentments and indictments were still written in a form clearly similar to that laid out in the 1388 Act. In 1820 a Manchester tanner was indicted for producing "noisome offensive and stinking liquor" which he let leak into a number of streets. The indictment states that because of this leakage, "the air … was thereby impregnated with the said noisome and offensive smells and stenches and was thereby rendered and then and there became and was corrupted offensive uncomfortable and insalubrious to the great damage of all…"[18]

In the late eighteenth and early nineteenth centuries, local authorities and individuals began to employ public nuisance as a way to deal with the unprecedented smoke pollution created by the furnaces used to power steam engines and various other industrial processes. In this way, they sought to utilise an old and established form of legal remedy to address a new social problem, that of severe industrial pollution.

On the eve of industrialization, therefore, the legal regime adopted to combat industrial smoke pollution was that provided by the traditional common law of nuisance, whose doctrine had developed over many centuries, and was not restricted to pollution problems. Rather, it was a broad legal category of crimes and torts, or wrongs that had gradually adapted to meet the needs of English society as industrial sectors grew in size and number. As a result, when local authorities and individuals began, in the late eighteenth and early nineteenth centuries, to deal with the unprecedented smoke pollution created by the furnaces used to power steam engines and various other industrial processes, the phenomenon was initially understood within the parameters of pre-industrial common law nuisance doctrine. This gave it two distinct characteristics: first, it was defined as part of a class of actions all constituting nuisances, and thus was not treated as a new form of social problem requiring particular legal remedies; and second, it was inherently relational in nature, and it was decided on a case-by-case basis rather than according to a written legal code. These features of the law and the manner in which they were employed to fight industrial pollution now will be examined in greater detail.

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[17] *Rex v White and Ward*, [1757] 97 *English Reports*., p.338.
[18] Lancashire R. O., QSI/1/195, Salford Hundred, Michaelmas Sessions 1821.

Definition of nuisance: smoke pollution located within a class of actions deemed nuisances

William Blackstone, in his *Commentaries on the Laws of England,* first published in 1765, described the unifying feature of the category of nuisance under the common law in the following way: "Nusance, *nocumentum*, or annoyance, signifies any thing that worketh hurt, inconvenience, or damage."[19] Thus nuisance was a type of action defined primarily by its effects, rather than as a specific offence or offences (i.e. smoke emission). Following his definition, Blackstone gave several examples of what constituted a nuisance, which revealed that this was often a matter of significant judicial interpretation. It was a nuisance, for instance, to set up an "offensive trade" in close proximity to a neighbour, but not a nuisance to set one up at a reasonable distance from one's neighbours since offensive trades were also "lawful and necessary trades" in and of themselves and only became nuisances if operated in an unreasonable manner. The key consideration of nuisance that required interpretation and the balancing of interests was that a nuisance had to cause more than simply the infringement of one's "pleasure" or superficial enjoyment of something; tangible suffering and deprivation had to result. As Blackstone explained, "... depriving one of a mere matter of pleasure, as of a fine prospect by building a wall, or the like; this, as it abridges nothing really convenient or necessary, is no injury to the sufferer" (and was therefore not a nuisance).[20] Therefore, industrial smoke pollution was not automatically considered a legal nuisance. Smoke emissions had to be proven to cause significant, tangible harm to either neighbouring lands (in the case of private nuisance) or the health of the community (in the case of public nuisance) in order to become an "actionable nuisance", for which legal action could successfully be undertaken.

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[19] J. Chitty, ed., *Commentaries on the Laws of England: By the late Sir W. Blackstone* (London, 1826 edition), p. 216. William Blackstone was a professor at Oxford and later Judge of the Court of Common Pleas. His *Commentaries on the Laws of England*, based on his lectures at Oxford, became the primary guide to the common law well into the nineteenth century.

The classification of industrial smoke pollution within the category of nuisance, and in particular public nuisance, and the fact that it was treated in the same way as many other, more ancient nuisances is seen from an examination of various local nuisance indictments from the eighteenth and early nineteenth centuries. From the mid-eighteenth century until the 1830s and the far-reaching reforms to local government of that decade, there were many indictments for nuisances of an environmental nature. The nature of many of these offences remained largely unchanged over this period of time. In all the localities studied, there was a basic pattern in which presentments for nuisances could be initiated by either the local authorities or members of the public. Additionally, each locality had a set of practices designed to keep a number of environmental matters under control. Therefore, there were various ways in which community leaders and community members could enforce accepted environmental standards.

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[20] J. Chitty, ed., *Commentaries on the Laws of England: By the late Sir W. Blackstone*, p. 217.

In the case of eighteenth-century Bedford, constables inspected the areas within their jurisdiction and reported to the justices of the peace at each meeting of the Court of Quarter Sessions (four times annually). Issues such as streets and bridges in disrepair, polluted ponds and ditches, and dangerous obstructions on public ways were regularly sought out by the constables. Constables' presentments similar to one of 1753, for instance, in which the constables of Bedford presented that all was well except for the fact that a "ditch and footway in Mill Lane are in a dangerous condition", were common throughout the eighteenth and early nineteenth centuries.[21] In 1763, the constable of Mill Lane Ward presented that the drain in Mill Lane was "choke't with Dirt and Nastiness",[22] and in 1777 the constable of the same ward presented William Thomas, a Bedford innkeeper, for not scouring and cleaning Castle Ditch within his ward.[23] Alternatively, a constable from a different ward presented a location in need of attention, where he declared, "the common Diping place near the Swan Inn as a Nuisance".[24]

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[21] Bedfordshire and Luton Archives and Record Service, QSR 1753, Borough Sessions, nos. 92-98.
[22] Bedfordshire and Luton Archives and Record Service, QSR 1763, Borough Sessions, no. 75.
[23] Bedfordshire and Luton Archives and Record Service, QSR 1777, Borough Sessions, no. 165.
[24] Bedfordshire and Luton Archives and Record Service, QSR 1777, Borough Sessions, no. 178.

Many other nuisance proceedings of an environmental nature were initiated as needed in response to a wide variety of offences. These included poaching, stealing wood, undergrowth, and timber from private lands or damaging natural resources on such land, inappropriate use of commons, and inhumane treatment of people (usually the poor in workhouses or poorhouses) and animals. Some of these were similar to the problems noted by the town constables, such as an indictment of Thomas Harborough, a yeoman from Maulden, for altering a stream so that it ran over the footpath leading from Greenfield to Ampthill.[25] Others were more striking in terms of the offences they revealed as well as the unwillingness of the community to accept such actions, the most poignant example being an indictment from 1759 of Jonathan Quince, a Maulden labourer and keeper of a workhouse, for ill-treatment of the inhabitants of the workhouse. Quince allegedly kept eighteen poor men, women and children in two rooms and neglected to provide sufficient "sustenance and firing for an 18-month old child."[26] Nearly fifty years later, the owner of a windmill was presented because the windmill caused horses and cattle to be "terrified and frightened". This is a particularly interesting presentment because the quarter sessions records also contain a certificate from a justice of the peace attesting to the fact that the windmill had been removed.[27] Therefore, the ancient custom of ordering the removal or abatement of a nuisance was still being exercised when needed.

On occasion, the indictments illustrate efforts by local government to seek an appropriate balance between the ancient rights of inhabitants to benefits such as gleaning (a right of the poor to collect the corn or other grains left in fields after they had been harvested) and use of the commons and public ways, streams and other places used by the public with, on the other hand, the tendency of others to exploit those rights. In 1790, for example, a man was caught and indicted for stealing rye through the process of gleaning. It was recorded that he had taken the rye in retaliation against another person who had unlawfully cut and removed hay from the commons.[28]

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[25] Bedfordshire and Luton Archives and Record Service, QSR 1755, Borough Sessions, no. 93b.
[26] Bedfordshire and Luton Archives and Record Service, QSR 1759, no. 67.
[27] Bedfordshire and Luton Archives and Record Service, QSR 1802, nos. 76 and 156.

The few industrial offences that are included in pre-industrial revolution nuisance indictments in Bedfordshire are similar in this regard. In 1789, a recognizance was recorded in the quarter sessions for Thomas Lucas to appear to face an accusation for polluting a stream with the products of his trade (leather tanning). He was later indicted for throwing "allum lime and other things used for dressing skins of beasts" into a stream running through the village of Birchmore, Woburn, that was used communally by the inhabitants of the village.[29] Action against Lucas appears to have been initiated by another individual in the community, but he was indicted for a public nuisance because the pollution he discharged into the stream was alleged to have harmed all the inhabitants of the village. Pollution was therefore understood to be activity that upset the balance between, on one hand, the property rights of community members and, on the other hand, the right to access natural resources possessed by the community as a whole.

Many similar legal proceedings can be found in Lancashire, although in that county indictments tended to be issued by a jury upon consideration of facts presented to it by either individual community members or local authorities. At the beginning of each quarter sessions meeting, juries were convened for this purpose. In 1821, for instance, a jury indicted Richard Shaw, a husbandman from Bolton by the Sand, for dumping "one hundred Cartloads of Filth Ordure and Dung" near houses and public streets.[30] Here, as in Bedfordshire, Shaw was indicted because of the negative effects of his actions on the health of the inhabitants of the area in which he lived.

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[28] Bedfordshire and Luton Archives and Record Service, QSR 1790, no. 46.
[29] Bedfordshire and Luton Archives and Record Service, QSR 1789, nos. 166 and 280.

Indictments relating specifically to industrial smoke pollution focus on the fact that smoke emission from furnaces that were fuelled by coal caused "corruption" of the air. This was the case in all the local indictments under study. Here again Blackstone's *Commentaries* are helpful. They list three classes of nuisances concerning private houses. First, if something was built in such a way that it was "overhanging" a house; secondly, if anything was found to be "stopping ancient lights" enjoyed by a house for a long time; and thirdly, "corrupting the air with noisome smells: for light and air are two indispensable requisites to every dwelling".[31] Therefore smoke pollution appears to have originally been dealt with through the third of these, due to the fact of its "corrupting the air". This terminology had been formalised and reinforced in the 1388 *Act for the punishment of them which cause corruption near a city or great town to corrupt the air* which gave local authorities power to indict people whose industrial pollution caused the air to become "greatly corrupt and infect".[32]

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[30] Lancashire R. O., QSI/1/195, Lonsdale Hundred, Easter Sessions 1821.
[31] J. Chitty, ed., *Commentaries on the Laws of England: By the late Sir W. Blackstone*, p. 217.
[32] 12 Richard II, c. 13 (1388).

The use of this terminology of corruption of the air can be seen in many indictments at quarter sessions in industrial areas. For instance, in 1821, Robert Worswick, a labourer from Boothfold, Lancashire, was indicted for operating a forge in which he was accused of burning,

> … divers large quantities of Coal Ashes and Slack and thereby wrongfully cause and procure divers large quantities of noisome offensive and unwholesome soot and smoke to be issued and omitted from the said Forge Furnace Buildings and erections so that the Air on the said several days … was rendered and became and was corrupted and offensive uncomfortable and unwholesome …[33]

Also in 1821, at the Court of Quarter Sessions it was presented that Thomas Rycroft of Barnsley (near Sheffield), West Yorkshire, set up a factory in which he operated "divers Steam Engines Furnaces and Stoves to wit ten Steam Engines twenty Furnaces and twenty Stoves". He used these furnaces, stoves, and steam engines over a number of months and close to numerous public streets and houses, during which time Rycroft,

> … unlawfully and injuriously burn[ed] and consume[ed] … in the said Steam Engines Furnaces and Stoves … divers large quantities of Coal Coke Wood Ashes and noisome and offensive Materials by means of which said several Premises divers noisome offensive and unwholesome Smokes Vapours smells and stenches … were emitted and issued from the said Erection or Building so that the Air … was thereby greatly filled and impregnated with the said Smokes vapours smells and stenches and was rendered and became and was corrupted offensive uncomfortable and unwholesome to the great damage and common nuisance of all the liege subjects of our said Lord the King there inhabiting being and residing and going returning and passing through the said Streets and Highways and against the Peace of our said Lord the King his Crown and Dignity …[34]

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[33] Lancashire R. O., QSI/1/195, Amounderness, Blackburn and Leyland Hundred, October Sessions 1821.

[34] West Yorkshire Archive Service, QS4/56, Sheffield Sessions 24 Oct. 1821.

In West Yorkshire, in the township of Horton (near Bradford), Richard Fawcett, a worsted spinner, was also accused of setting up two steam engines "and divers Furnaces and Stoves employed in working the said Engines by Steam" and allegedly "did … unlawfully injuriously and negligently use the said Engines …" by burning coke, coal, and charcoal in them. The result was that,

> … divers noisome unwholesome and offensive Smells Stenches Smokes and Vapours … were emitted and issued … so that the air … was thereby greatly filled and impregnated with the said Smells Stenches Smokes and Vapours and was rendered and became and was greatly corrupted offensive uncomfortable and unwholesome to the great damage and common nuisance of all the liege Subjects of our said Lord the King …[35]

The similarity of the wording of smoke nuisance indictments, which appears to have originated in the 1388 *Act for the punishment of them which cause corruption near a city or great town to corrupt the air*, across counties, is quite remarkable. This Act was in fact concerned with the dumping of industrial waste into public watercourses which then caused bad smells, but the proximity of its wording to the smoke pollution indictments of the early nineteenth century suggests that it continued to be influential more than 400 years after its enactment. Equally notable is the fact that the same language was used to describe a wide variety of offences that involved bad smells and corrupted air. This conception of corrupting the air and its harmful effects on the public at large was a common theme in nuisance indictments of a more ancient, pre-industrial nature. Blackstone provided one example involving animals: "if a person keeps his hogs, or other *noisome* animals, so near the house of another, that the *stench* of them incommodes him and makes the air *unwholesome*" it is a nuisance.[36]

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[35] West Yorkshire Archive Service, QS4/56, Pontefract Sessions 15th Apr. 1822.

Many such indictments were issued in Lancashire in the same years as the smoke pollution indictments examined above. A Bolton husbandman who allegedly "…near the Dwellinghouses of divers liege subjects of our Lord the King and also near divers Streets and Common highways there did unlawfully and injuriously lay spread and deposit … one hundred Cartloads of Filth Ordure and Dung …" was indicted for the reason that he left the manure in this inappropriate location, "… whereby divers unwholesome and noisome smells from the said filth ordure and dung did then and there arise so that the air there was *greatly corrupted and infected…*"[37] In the same year, 1821, a jury indicted three ironmongers from the hundred of Amounderness, Blackburn and Leyland because they had dumped waste straw into "a certain deep place" too near many houses and public streets. The rotting straw caused "divers noisome offensive and unwholesome vapours smells and stenches" which, in turn, led the jury to declare that the air around the straw "… was thereby greatly filled and impregnated with the said vapours smells and stenches and was thereby *rendered and became and was corrupted offensive uncomfortable and unwholesome …*"[38] A particularly strange case was recorded in the records of the hundred of West Derby a few months later. A man was indicted for keeping a mare, and the mare allegedly "was and still is very much diseased and had and still hath upon certain parts of its body to wit upon one of the hind feet and hoof … a certain unhealthy loathsome raw and uncovered excrescence and sore…" The very same wording is used even in this case, the jury asserting that "divers filthy noxious noisome and unwholesome smells and stenches" came from the mare, the result being that "the air thence was and yet is thereby greatly corrupted and infected".[39]

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[36] J. Chitty, ed., *Commentaries on the Laws of England: By the late Sir W. Blackstone* (London, 1826 edition), pp. 216-217. (Emphasis added).
[37] Lancashire R. O., QSI/1/195, Lonsdale Hundred, Easter Sessions 1821. (Emphasis added).
[38] Lancashire R. O., QSI/1/195, Amounderness, Blackburn and Leyland Hundred, Easter Sessions 1821. (Emphasis added).

A very similar group of cases is recorded in the West Yorkshire quarter sessions in the late eighteenth and early nineteenth centuries. One of the earliest cases was that of a Wakefield butcher, John Ward, indicted for putting into "open wooden Vessels … divers Quantities of the Gutts Entrails and Offals of Sheep and Sheep puddings and extract the Excrements and other filth therefrom". In almost exactly the same wording as the Lancashire cases, Ward's actions were deemed to have caused "divers noisome pestilential and unwholesome Smells" so that "the air there was and yet is thereby greatly corrupted and infected".[40] In a very similarly worded indictment nine years later, another butcher was indicted along with a grocer, although this time for polluting a body of water through the inappropriate use of a sewer. The same complaint was used, however, that in dumping his waste into the water they also polluted the air. It was alleged that he

> … unlawfully and injuriously did make cause and continue a certain noisome and offensive Sewer and Channel and down the same Sewer the Channel did … pour great Quantities of offals Dung and other filth By Reason whereof divers hurtful and unwholesome Smells did then and there arise and the air there became and was greatly corrupted To the Common Nuisance of all the liege Subjects of the said Lord the King …[41]

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[39] Lancashire R. O., QSI/1/195, West Derby Hundred, Midsummer Sessions (July) 1821.
[40] West Yorkshire Archive Service, QS4/38, Leeds Sessions 5th October 1775.
[41] West Yorkshire Archive Service, QS4/41, Sheffield Sessions 13th October 1784.

Almost identical wording can be seen in an indictment of a Lancashire industrialist from 1823, although not for an offence involving smoke pollution. Here again, the initial offence was of dumping harmful matter, but the corrupting effect of the dumping of the matter was what constituted the harm to the public. John Stopford, a "cotton spinner", was accused of two counts of digging large pits into which he dumped 500 gallons of "dirty filthy and unwholesome water by reason of which said Premises divers noisome offensive and unwholesome vapours smells and stenches … were emitted or issued from the said pit or hole and the water therein contained…" The result was that the air "was thereby greatly filled and impregnated with the said vapours smells and stenches and was rendered and became and was corrupted and offensive uncomfortable and unwholesome to the great damage and common nuisance of all the liege subjects …"[42]

Moreover, owners of steam engines could be indicted for more than just smoke pollution, and sometimes even within one indictment a number of different offences concerning the use of steam engines were listed. For example, in 1819, an iron founder and a labourer were indicted together for building, near houses and public roads, "a certain iron foundery [sic.] with a furnace and steam engine for the manufacturing of boilers pans and divers other articles …" The jury first asserted that they "did … make and cause to be made with divers large hammers and other heavy instruments and by striking the same against boilers pans and other articles divers great loud and continued noises by day and by night … and thereby deprive all the liege subjects … there inhabiting residing and being of their natural sleep rest and comfort …" The second finding of the jury was that the offenders did

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[42] Lancashire R. O., QJI/1/196, Salford Hundred, July Sessions 1822.

"cause and procure the said furnace and steam engine to send forth and emit divers large quantities of soot smoke and other offensive matter ..."[43] In this indictment, both the noise and the smoke emitted by the foundry were considered to be sufficiently unreasonable and unacceptable that the firm itself became a public nuisance. This suggests that it was not until further into the nineteenth century that smoke pollution was identified as an offence in and of itself, and as an undesirable action regardless of the particular circumstances surrounding its creation or effects on the community.

To sum up, under the common law, the act of emitting smoke itself was not an indictable offence; it only became so when it reached a level at which the air became corrupted and the health or property of others was thereby damaged. A wide variety of activities, both industrial and non-industrial, were deemed nuisances and were dealt with through ancient and strikingly similar means. Smoke pollution was treated in the same way. Industrial smoke pollution was therefore not dealt with as a unique offence, new to industrial society, that required a new form of regulation. Rather, it was regulated in the very same way that offences involving the emission of smells perceived to be harmful had been managed for many centuries, through the mobilization of long-established common law remedies.

Definition of nuisance: its relational character

Under the common law, the definition of a nuisance contained several vital aspects. The key concept involved in private nuisance is the ancient doctrine of "sic utere tuo", under which landowners could only use their land in ways that did not damage neighbouring property. This concept contained an element of relativity in the sense that a nuisance was always considered to be an action that was harmful in relation to others. In other words, in order to be considered a nuisance, an action had to affect someone else. Blackstone made this point clearly in his *Commentaries*, when he defined a nuisance as "any act therein, that in its consequences must necessarily tend to the prejudice of one's neighbour." This was true of both public and private nuisance. A private nuisance affected a neighbour's property or enjoyment thereof, while a public nuisance hurt the comfort and health of the community as a whole. Public nuisance did not involve harming the property of another individual, but it still contained the relativity found in private nuisance since an offender's actions had to be found to constitute "annoyance to *all* the king's subjects" in order to be deemed a nuisance.[44]

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[43] Lancashire R. O., QJI/1/193, Salford Hundred, April Sessions 1819.

Therefore, under the common law an action in and of itself did not constitute a nuisance; rather, its effects on others constituted one. Blackstone offered a good example of a nuisance involving an industrial process: "if one erects a smelting-house for lead so near the land of another, that the vapour and smoke kills his corn and grass, and damages his cattle therein, this is held to be a nuisance."[45] The emphasis is on the damage caused by the setting up and operating of the smelting-house too near the lands of a neighbour. As a result, people who sought to bring action against others for nuisances were required to show that they had suffered damage as a result of the activity alleged to be a nuisance.

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[44] J. Chitty, ed., *Commentaries on the Laws of England: By the late Sir W. Blackstone*, p. 216.
[45] Chitty, ed., *Commentaries on the Laws of England*, p. 217.

Thus, the common law definition of smoke pollution was based on the premise of personal annoyance or injury to others, rather than on damage to the atmosphere or environment, or any other concepts more abstract and removed from individual experience. This understanding of pollution in terms of nuisance law—as an action by one party unreasonably harming the property or health of others—is reflected in local public nuisance indictments at quarter sessions. In these records, the descriptions of the offences laid out in each indictment showed concern for the effects of the smoke on the public, rather than the act of producing the smoke. For example, in an 1821 case similar to numerous others brought before the Lancashire quarter sessions, Robert Worswick, a blacksmith from Boothfold, built and operated a blacksmith's forge in close proximity to houses and a public highway. He was indicted for, among other things, emitting "noisome offensive and unwholesome soot and smoke". The Concern of the jury was that the air had been adversely affected by the emission of smoke, and not on the fact that Worswick had contravened any rule or law in burning the fuel that had caused the smoke. The second count of the indictment was even more explicit in its focus on the harmful effects of Worswick's actions on the public. It was alleged that Worswick,

> … did wrongfully and injuriously cause and procure divers large and Excessive quantities of Soot Smoke sparks and burning matter and flame … to be issued and emitted from a certain Building Smiths Forge and Furnace there and also from divers large heaps of Coals Slack and Ashes and other combustible materials by the said Robert Worswick put placed and burnt in the open air there near to … Dwellinghouses and … a public highway … so that the air … became and was corrupted and offensive uncomfortable and unwholesome and *injurious to the goods and Chattels of all the liege subjects of our said Lord the now king* there inhabiting passing and being to wit at Boothfold … *to the*

> *great damage and common Nuisance of all the said liege subjects …* and against the peace …[46]

Here again, Worswick's creation of smoke, sparks, etc. was "wrongful" and "injurious" because it hurt "all the said liege subjects" of the king because it polluted the air they breathed and damaged their property. There is no mention of Worswick contravening any statute or bylaw or other general rule prohibiting smoke emissions, since none existed.

Similarly, in 1819, an iron founder and a labourer from Little Bolton (Salford Hundred, Lancashire) were indicted together for building a foundry too near to houses and public roads. The jury decided that they "did … make and cause to be made with divers large hammers and other heavy instruments and by striking the same against boilers pans and other articles divers great loud and continued noises by day and by night *and thereby deprive all the liege subjects ... there inhabiting residing and being of their natural sleep rest and comfort* …"[47] The reasons compelling the court to include so much emphasis on the effects of the industrial activities most likely included the ancient notion that a person's actions had to adversely affect others in order to constitute a nuisance.

Definition of nuisance: case by case decision making

Connected to the relational nature of common law nuisance is the fact that decisions in nuisance cases are arrived at on a case by case basis, since the justices or jury members had to decide whether an alleged offender had caused unreasonable damage to the property of another person or to the public good. There was no codified definition of an act constituting a nuisance. Instead, justices, juries, or any other official or body presiding over cases had to employ their discretion in adjudicating different elements of each case.

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[46] Lancashire R. O., QSI/1/195, Amounderness, Blackburn and Leyland Hundred, October Sessions 1821. (Emphasis added).
[47] Lancashire R. O., QJI/1/193, Salford Hundred, April Sessions 1819. (Emphasis added).

This aspect of common law nuisance continued to form an integral aspect of English environmental law in the early nineteenth century. By this time, numerous legal scholars, foremost among them Jeremy Bentham, had attempted to codify the common law and introduce to it some organising principles. However, the English common law proved resistant to codification, and in the early nineteenth century remained a system in which "judges attempted to discover through deductive reasoning the resolution of the dispute from the material facts presented by the litigants in each case."[48] As a result, local nuisance indictments for smoke pollution in the early nineteenth century always contained remarkable amounts of detail. This was often not the case with other types of nuisance indictments. For example, Richard Fawcett, from Horton (Bradford), a worsted spinner was indicted. The indictment is of a length and contains a level of detail typical of all the examples I found in West Yorkshire and Lancashire. It was alleged that Fawcett did,

> … with force and arms at the Township of Bradford … near to divers public Streets being the Kings Common Highways there and also near to the Dwellinghouses of divers liege Subjects of our said Lord the King there situate and being did unlawfully injuriously and improperly construct make set up and place … divers to wit two Engines worked by Steam and divers Furnaces and Stoves employed in working the said Engines by Steam respectively, to wit, ten Furnaces and ten Stoves and that the said Richard Fawcett did … unlawfully injuriously and negligently use the said Engines …[49]

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[48] J. F. McEldowney and S. McEldowney, *Environmental Law and Regulation* (London, 2001), p. 21.

[49] West Yorks. Archive Service, Pontefract Sess., 15th Apr. 1822.

The record then goes on to state that in using the steam engines, stoves and furnace, he burnt

> … divers large quantities of Coke Coal Charcoal Wood and other Materials by reason of which said several Premises divers noisome unwholesome and offensive Smells Stenches Smokes and Vapours … were emitted and issued … so that the air … was thereby greatly filled and impregnated with the said Smells Stenches Smokes and Vapours and was rendered and became and was greatly corrupted offensive uncomfortable and unwholesome to the great damage and common nuisance of all the liege Subjects of our said Lord the King …"[50]

It is clear from this account that the authorities wished to include as many facts of relevance to the indictment as possible since each nuisance conviction depended upon the justices' or jury's consideration of the individual events of each case. In including so much detail, they were confirming that the offenders had indeed used their property in an unreasonable manner, and had caused excessive harm to the public good.

Conclusion

This chapter has described the common law procedures and remedies that comprised the long-established system of environmental management at the beginning of the industrial revolution. Along with various other forms of pollution and annoyance, both industrial and non-industrial, smoke pollution was treated as a legal nuisance, along with various other forms of pollution and annoyance. Nuisance law was not new; rather, it had formed the established legal means for attacking pollution for centuries. It thus provided a distinct conception of smoke pollution largely independent of the immediate context of accelerating industrialization prevailing in the late eighteenth and early nineteenth centuries. Due to the relational character of nuisance in its legal sense, the definition of smoke pollution in this period was largely a matter of degree. Industrial pollution was created when legal trades were practised in an unreasonable manner, leading to the excessive emission of smoke. Moreover, the emphasis on close examination of the particular details of each case, nuisance law provided a largely reactive form of enforcement, in which legal action could be taken upon the creation of a nuisance.

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[50] West Yorks. Archive Service, Pontefract Sess., 15th Apr. 1822.

This initial approach to pollution control was gradually superseded, however. Over the course of the nineteenth century, there followed a series of attempts to break away from several integral aspects of the common law regime outlined in this chapter. Several legislative initiatives were undertaken, the first of which was the *Smoke Prohibition Act of 1821*. The creation of this Act forms the subject of Chapter Two.

Chapter 2. The 1821 *Smoke Prohibition Act*: Optimism and the Spirit of Improvement

Introduction

Chapter One described the common law remedies used to fight industrial pollution. At the beginning of the industrial revolution, smoke pollution was included among a wide variety of offences deemed nuisances. As industrialization took root, nuisance law was the predominant means resorted to by those seeking to stem the rising tide of noxious atmospheric pollution that accompanied the growth of England's industrial base.

With industrialization, however, came a number of developments that led to pressure for further regulation. The adoption of steam engines in the place of water and animal power allowed industries to become geographically concentrated in towns. After the establishment of peace at the end of the Napoleonic Wars in 1815, many new factories opened and the population grew greatly in urban areas. As a result, smoke emissions became more damaging to many more people.

Despite this changing environment, the initial anti-pollution legislation enacted in the nineteenth century in response to the growth of industrial atmospheric pollution, the 1821 *Smoke Prohibition Act*, was designed to strengthen the common law system of actions and remedies and encourage its further usage. Numerous historians have argued that the 1821 Act was ineffectual due to its failure to move beyond common law remedies by imposing stricter statutory regulations on industrial polluters.[1] I will argue, however, that such historians are overly dismissive of its merits and accomplishments. By the later nineteenth century, the common law regime was proving inadequate in the face of rapid industrial progress; by contrast, in the 1810s and 1820s, common law nuisance actions were resorted to and could be successful. As noted in chapter one, the laying of indictments and the threat of nuisance suits served as powerful tools for local authorities and individual community members. The creators of the 1821 Act, in seeking to retain and buttress legal constraints which they believed to be largely effective, were informed by a coherent and long-established set of assumptions concerning the nature of industrial activity and pollution, and the nature of enforcement and the responsibilities of individuals in that regard. Their testimony reveals their great optimism concerning the possibility of eliminating excessive industrial smoke in a cost-effective manner and the willingness of industrialists to undertake the necessary steps to achieve this.

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[1] See notes 5, 6, 7 below.

When seen in this light, it becomes clear that the 1821 *Smoke Prohibition Act* cannot be dismissed as simply a weak first attempt at pollution control amounting to nothing. Rather, it was thought out in response to an increasing awareness of pollution, and was premised upon faith in the existing system. This new reading of the circumstances surrounding the passage of the 1821 Act allows one to see the Act in a more positive context, and thus challenges several historiographical assumptions with respect to environmental regulation in the nineteenth century. It also provides important background to subsequent legislative attempts of the later nineteenth century. With its enactment, a national law devoted solely to industrial smoke pollution was created, something which would not be achieved again until the mid-twentieth century. In the 1840s and 1850s, attempts were made to create a new national Act that would represent a new and more forceful approach to smoke pollution elimination. However, such targeted legislation was never fully achieved, and smoke pollution eventually came to be included in several broader Acts, culminating in the *Public Health Act* of 1875, in a more constricted and conservative manner. The interpretation of the 1821 *Smoke Prohibition Act* offered in this chapter not only does greater justice to the Act itself; it also serves to reveal the conservative and disappointing character of the smoke law of the later nineteenth century.

The 1821 Smoke Prohibition Act: its creation

The 1821 *Smoke Prohibition Act* encouraged the usage of common law remedies to attack industrial smoke pollution, *inter alia,* by giving the courts who heard nuisance cases the power to award legal costs to people who undertook nuisance prosecutions. This was deemed necessary because severe problems were caused by industrial smoke pollution, but nuisance litigation could be very costly, serving as a deterrent to potential prosecutions. The Act included the following preamble:

> Whereas great Inconvenience has arisen, and a great Degree of Injury has been and is now sustained by His Majesty's Subjects, in various Parts of the United Empire, from the improper Construction as well as from the negligent Use of Furnaces employed in the working of Engines by Steam: And Whereas by Law every such Nuisance, being of a public Nature, is abateable as such by Indictment; but the Expence attending the Prosecution thereof has deterred Parties suffering thereby from seeking the Remedy given by Law: Be it therefore enacted … That it shall and may be lawful for the Court by which Judgment ought to be pronounced in case of Conviction on any such Indictment, to award such Costs as shall be deemed proper and reasonable to the Prosecutor or Prosecutors, to be paid by the Party or Parties so

> convicted as aforesaid, such Award to be made either before or at the Time of pronouncing final Judgment, as to the Court may seem fit.[2]

The question of the motives and goals of those responsible for the 1821 *Smoke Prohibition Act* is important, not only because this was the first recognizably "modern" statute dealing with industrial pollution, but also because several historians regard the Act as ineffectual and insignificant. This view of the 1821 Act dates to the mid-nineteenth century. In the 1850s, the award-winning smoke abatement expert Charles Wye Williams discussed existing smoke law in his *Prize Essay on the Prevention of the Smoke Nuisance*, an essay awarded a gold medal by the Society for the Encouragement of Arts, Manufactures, and Commerce. He noted that the 1821 Act "appears to be the first in which the issue of smoke was recognised as a nuisance." He then described the provisions of the Act and concluded that, with respect to the powers conferred upon judges, "[it] need scarcely be observed that such power was not likely ever to be called in operation, and the Act consequently became a dead letter."[3]

Future commentators took up Williams' assessment. In *The Law of Smoke Nuisances* (1938), for instance, legal scholar W. R. Hornby Steer described Elizabethan smoke prohibitions and the publication of John Evelyn's *Fumifugium* in 1661. He then added that Evelyn's ideas for eliminating excessive coal smoke emissions were only taken up in 1819, but neglected to mention the 1821 Act, stating instead that following the convening of the Select Committee in that year

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[2] *An Act for giving greater Facility in the Prosecution and Abatement of Nuisances arising from Furnaces used and in the working of Steam Engines (Smoke Prohibition Act)*, 1821. 1 & 2 Geo. IV (1821), c. 41, s. 1.

[3] C. W. Williams, *Prize Essay on the Prevention of the Smoke Nuisance* (London, 1857), p. 44.

(which eventually drafted the Act), "[n]o further action appears to have been taken until 1843 ..."[4]

It is therefore not surprising that numerous current historians have adopted a similar view of the 1821 Act. Brian Clapp argues it was not effective and "added little if anything to substantive law and simply served to state that Parliament was against smoke, rather than for it."[5] Peter Brimblecombe mentions the 1821 Act in his *The Big Smoke: A History of Air Pollution in London since Medieval Times*. While he points out that the legislators seeking to create a smoke law in 1819 and 1820 undertook research into smoke eradication and that "[i]n the main the results were impressive", Brimblecombe nonetheless concludes that the 1821 Act "was so weak, however, that it probably had little effect on the air pollution in London."[6] Similarly, in the most extensive study of the 1821 Act, provided in *The Politics of Clean Air*, Eric Ashby and Mary Anderson characterize the Act as made up of "innocuous clauses which were aimed at no more than the encouragement of prosecution under common law."[7] They do, however, recognise the importance of the law as a first attempt at industrial pollution control, albeit a woefully unsatisfactory one: "The State had taken a first timid hesitant step toward a policy for clean air; and those whose interests were threatened by a clean air policy had put up their first defence."[8]

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[4] W. R. Hornby Steer, *The Law of Smoke Nuisances* (London, 1938), p. 10.
[5] B. W. Clapp, *Environmental History of Britain* (London, 1994), p. 32.
[6] P. Brimblecombe, *The Big Smoke: A History of Air Pollution in London since Medieval Times* (London and New York, 1987), p. 101.
[7] E. Ashby and M. Anderson, *The Politics of Clean Air* (Oxford, 1981), p. 5.
[8] Ashby and Anderson, *The Politics of Clean Air*, p. 5.

Most other writers do not even mention the Act or the discussions and debates surrounding it.[9] This treatment of the *Smoke Prohibition Act* and the committee reports that informed its creation is, however, inadequate and unfortunate. These documents in fact mark the beginning of a period of vibrant debate concerning the possibility and desirability of eradicating smoke pollution and of several serious attempts to create meaningful smoke abatement legislation.

Although legislation had been used by English rulers since the early Middle Ages, it only became a significant part of English law in the eighteenth century.[10] Statutes have been used over the centuries as a means to counter the very slow pace of change attributable to common law and equity proceedings and to alter the common law in response to changing social conditions.[11] Although the procedures for creating legislation were much the same in the early nineteenth century as they are today,[12] several key differences are noteworthy. The number of statutes enacted increased dramatically beginning in the reign of George III, but commentators continually bemoaned the poor quality of the laws in terms of both content and wording.[13] Members of Parliament who put forward legislation often had trouble convening the required parliamentary committees to review and amend bills. In addition, individual members of Parliament lacking expertise in legislative drafting often drafted bills themselves. Today, by contrast, specialists called Parliamentary Counsel draft all British legislation.[14]

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[9] An exception is Frank Whitson Fetter, who describes the 1821 act as containing "very mild provisions" that did not cause any debate at all in the House of Lords. Fetter, *The Economists in Parliament* (Durham, 1980), p. 83.

[10] D. Keenan, *Smith and Keenan's English Law* (London, 1989), p. 9.

[11] V.C.R.A.C. Crabbe, *Understanding Statutes* (London, 1994), p. 2. Keenan, *Smith and Keenan's English Law*, p. 10.

[12] Then as now, bills were presented before Parliament at least three times, between which they were often debated and/or amended in parliamentary committees. They could be presented by the government, the opposition, or individual members. Crabbe, *Understanding Statutes*, p. 14.

[13] D. Lieberman, *The Province of Legislation Determined* (Cambridge, 1989), pp. 13-22.

However, this practice also reflected the fact that in the early nineteenth century, individual members could draft and present bills at their will. In 1819, Michael Angelo Taylor championed an industrial smoke pollution bill. Taylor sat in Parliament as a Whig, yet often dissented from his party's policies and opposed its leaders. He actively pursued reform of English criminal law and the Poor Law, and pursued urban improvement initiatives through legislation enabling new paving and gas lighting in addition to smoke elimination.[15]

The Commons Select Committee reports of 1819 and 1820 on smoke problems are characterized foremost by the optimism of both the committee members and of those testifying before it with respect to the problem of smoke pollution. The reports reveal that various people in different professions had either attempted to create smoke abatement technologies for use with steam engines and other industrial furnaces and fires or had in fact adopted such technologies. These included surveyors, industrialists, and merchants, whose attitudes toward smoke abatement was almost unanimously favourable and confident, most having found that the new methods of combustion provided the added benefit of greater fuel efficiency. Benjamin Hawes, a soap-boiler in Blackfriars (London) reported that he was very pleased with the smoke abatement apparatus invented by Josiah Parkes, a Warwick worsted manufacturer, which the latter had installed on his steam engine's furnace. Hawes and his father intended shortly to try applying the same technology to one of their soap-coppers.[16] William Brunton, a civil engineer at the "Eagle Foundery" in Birmingham, had also developed a "fire-regulator" to reduce smoke emissions. He first described his apparatus before the committee in 1819, and returned in 1820 to report that he had "erected eight fire-regulators, all of which have given the greatest satisfaction as regards burning the smoke … and they have uniformly effected a saving of coal, which on the average is more than 30 per cent."[17] A number of committee members also travelled to visit firms that had adopted smoke abatement technologies, all of whom testified to their efficacy.

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[14] Crabbe, *Understanding Statutes*, p. 5. The office of Parliamentary Counsel was created in 1869, and, according to A. H. Manchester, quickly became a highly esteemed office. A. H. Manchester, *Modern Legal History* (London, 1980), p. 37.

[15] R. Thorne, 'Taylor, Michael Angelo (1756/7-1834)', *Oxford Dictionary of National Biography*, Oxford University Press, 2004. Available online at: http://www.oxforddnb.com.login.ezproxy.library.ualberta.ca/view/article/27067, (9 Aug 2005).

In addition to the belief among the majority of the people involved in the 1819 and 1820 committees that significant smoke abatement was a realistic goal that would also offer the possibility of reducing fuel consumption, the reports shed light on the issue of indictments for nuisance at the local level. As noted in chapter one, such proceedings had been a regular practice for centuries. However, a number of historians argue that by the second half of the nineteenth century it became very difficult for ordinary citizens to secure indictments against industrial polluters.[18] This argument is further supported by primary evidence from Parliament. For example, in an 1846 parliamentary report on the problems experienced recently by local authorities seeking to reduce industrial smoke emissions, the authors mentioned that common law indictments were very rare because they were so difficult to obtain. Many factors worked against them: offences of this kind were usually considered a public, rather than private, nuisance, and were therefore more complicated to prosecute; magistrates were often also industrial polluters; and as the working classes gradually adjusted to the new realities of industrial society, the level of acceptance of industrial pollution rose. As the authors explain:

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[16] Report from the Select Committee on Steam Engines and Furnaces &c. 5 July 1820. *BSP* 1820. II. p. 243.

[17] Report from the Select Committee on Steam Engines and Furnaces &c. 5 July 1820. *BSP* 1820. II. p. 245.

[18] For example, see J. F. Brenner, "Nuisance Law and the Industrial Revolution", *Journal of Legal Studies* vol. 3, no. 2 (June 1974), pp. 403-433; M. J. Horowitz, *The Transformation of American Law, 1780-1860* (Cambridge, Massachusetts, 1977); J. Lowry and R. E Edmunds, eds., *Environmental Protection and the Common Law* (Oxford and Chapel Hill, 2000).

> The persons immediately subject to the nuisance of a smoky factory, for example, are in many cases dependent upon that factory for employment, or they are of a class which does not perceive any great prejudice to itself from the circumstance. These persons have been so long accustomed to its effects, that they have, by habit, become reconciled to that which might, at first, have been considered a nuisance, and they do not perceive the ultimate moral injury arising from want of cleanliness.[19]

Similarly, the 1862 report from the Committee on Noxious Vapours (which drafted the *Alkali Act*, 1863) stated that neither civil actions for damages for private nuisances nor indictments for public nuisance were effective methods for controlling industrial pollution. In both cases actions were expensive, financial compensation for prosecutors (members of the public who brought information to the justices that led to an indictment) was inadequate, and by this time it was often very difficult to trace smoke pollution to a particular firm in areas containing many different factories.[20]

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[19] Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 334.

[20] Report from the Select Committee of the House of Lords, on Injury from Noxious Vapours. 1 August 1862. *BSP* 1862, XIV, pp. 5-6.

Nonetheless, despite these difficulties identified in mid-century, witnesses before both the 1819 and 1820 committees mention the importance of indictments in encouraging industrialists to seek to adopt cleaner equipment and practices. In 1819, Joseph Gregson, a surveyor of building defects who had invented a process for reducing smoke, stated that various smoke abatement plans which required the use of larger quantities of fuel were "seldom adopted but where the parties have been or are under an indictment."[21] Similarly, in 1820, the owner of a Birmingham metal rolling plant, William Phipson, testified that, "I have had my attention particularly drawn to the consumption of smoke, as well as the saving of fuel, from the frequent complaints of my neighbours, and from the house having been once indicted for a nuisance."[22] The testimony of a witness from Manchester reveals the frequency of smoke nuisance complaints there. Thomas Fleming, a merchant, had served the previous dozen years as a commissioner under the Manchester Police Act, and one of the duties of the commissioners was to "force parties complained of to burn their smoke" upon complaint from the public. Fleming claimed to have been appointed to investigate complaints approximately twenty times, and mentioned two cases in particular in which he recommended that the polluters adopt smoke abatement mechanisms and, when they did so, this led to a great decline in the amount of smoke released by both premises.[23] All of these examples point to the fact that indictments for nuisance played an important role in environmental protection in the early nineteenth century. They contrast markedly with the committee evidence offered in 1846 and 1862, which emphasised the many factors making such indictments very difficult to prosecute. This suggests that common law nuisance indictments declined significantly in effectiveness over the early and mid-nineteenth century, a pattern which parallels the declining success of smoke abatement legislation over the same period.

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[21] Report from the Select Committee on Steam Engines and Furnaces. 12 July 1819. *BSP* 1819, VIII, p. 275.

[22] Report from the Select Committee on Steam Engines and Furnaces. 5 July 1820. *BSP* 1820, II, p. 241.

[23] Report from the Select Committee on Steam Engines and Furnaces. 5 July 1820. *BSP* 1820, II, pp. 250-251.

Aside from the preliminary reports investigating the possibility of reducing smoke pollution, the 1821 *Smoke Prohibition Act* itself includes provisions that shed light upon the goals of the legislators.[24] The law did not impose an outright ban on industrial smoke emissions, but rather its primary goal was to encourage members of the public to seek indictments of industrial polluters for public nuisance. As noted, it sought to accomplish this by allowing the prosecutors to recover the costs of the prosecution. While this might seem in hindsight to have been an inadequate response to industrial pollution, as Clapp argues, since it did not deem smoke emission a statutory nuisance or provide summary means for punishing polluters, if one considers the contemporary state of nuisance law, it is arguable that it was in fact a logical approach.

William Blackstone's description of the predominant remedy for private nuisance in the eighteenth century, the action on the case, is pertinent. Blackstone wrote that the key element of this remedy was that the plaintiff received pecuniary "satisfaction", or financial compensation, for the injury suffered as a result of the nuisance rather than the power to abate the nuisance.[25] Therefore, if monetary compensation was the crucial element of the action on the case remedy in this period, it is likely that the similar compensatory scheme introduced in the 1821 Act was something with which many people would already have been familiar. Moreover, if private nuisance actions were indeed as important in enforcing environmental standards at the beginning of the century as the evidence from 1819 and 1820 suggests, one must question whether this aspect of the 1821 law was as inadequate as Clapp, Brimblecombe and others argue. In this light, the inclusion of such a clause can be interpreted as a logical application of an existing common law practice to statutory law. This question becomes more important when evidence from local courts is considered. In Lancashire and Yorkshire, many indictments were laid in the years immediately following the passage of the 1821 Act. In those leading to a conviction, almost all saw the imposition of small fines (usually 6d.) but the additional charging of costs (usually around £25).[26] Overall, therefore, the awarding of costs to prosecutors enacted in the 1821 Act appears, first, to have been in accordance with long established common law practices, and, secondly, to have encouraged prosecution in certain regions (notably, areas severely affected by industrial pollution), at least in the short term.

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[24] *An Act for giving greater Facility in the Prosecution and Abatement of Nuisances arising from Furnaces used and in the working of Steam Engines (Smoke Prohibition Act)*. 1 & 2 George IV (1821), c. 41.

Another important feature of the 1821 law is the fact that it contained a clause empowering justices of the peace to require industrial polluters to install cleaner combustion technologies. Section 2 stipulated that when cases involving smoke pollution were brought before the justices,

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[25] J. Chitty, ed., *Commentaries on the Laws of England: By the late Sir W. Blackstone* (London, 1826 edition), III, p. 220. Blackstone pointed out that by law, individual property owners could abate nuisances themselves (pp. 219-220), but then could not seek legal redress for the same nuisance. In earlier centuries, sheriffs could also abate a nuisance at the defendant's expense if the defendant did not remove it when ordered to do so. See H. M. Chew and W. Kellaway, eds., *London Assize of Nuisance 1301-1431* (London, 1973), p. xviii-xix.

[26] See note 23 below.

> … if it shall appear to the Court by which Judgment ought to be pronounced in case of Conviction on any such Indictment, that the Grievance may be remedied by altering the Construction of the Furnace so employed in the working of Engines by Steam, it shall be lawful to the Court, without the Consent of the Prosecutor, to make such Order touching the Premises, as shall be by the said Court thought expedient for preventing the Nuisance in future, before passing final Sentence upon the Defendant or Defendants so convicted.[27]

This was very different from common law indictments, for which justices could only proceed upon the information of a member (or members) of the public, since it allowed the justices to act on their own if they so chose. Furthermore, under the common law of nuisance by this time, if one undertook an action on the case, each offence required its own suit and one could not sue to abate a nuisance that would be committed in the future. Here again Blackstone's explanation is helpful. He explained that actions on the case were in fact the only remedy for private nuisance still in practice in his time. Two older forms of remedy, the assize of nuisance (a hearing convened by the mayor, sheriff, or relevant local authority, with a jury) and the *quod permittat prosternere* (a writ of right asserting the plaintiff's right to abate a nuisance created by the defendant) had become obsolete. Actions on the case only allowed for the recovery of damages; it did not empower a plaintiff to abate a private nuisance, as he or she had been able to previously with an assize or a writ. Moreover, actions on the case only allowed for recovery of damages for a nuisance that had occurred at the time of the action. Therefore, if the defendant created the nuisance again, a new action would have to be undertaken,[28] and a repeat offender thus had to be prosecuted each time he or she re-offended. Instead of these potentially cumbersome requirements, section 2 of the 1821 *Smoke Prohibition Act* allowed courts to proceed on their own initiative and to impose long-term smoke abatement solutions, if these were available. In this way, the public could be relieved of the necessity of repeatedly seeking indictments against industrial polluters, and justices could take a more pro-active approach to pollution control by requiring those polluters to act to reduce pollution in the long term. The fact that they were empowered to do this without the consent of the prosecutor underlines the fact that this Act gave justices real powers to act if they so chose. The goal of section 2 is reflected in the full title of the Act, which is "for giving greater Facility in the Prosecution and Abatement of Nuisances arising from Furnaces used and in the working of Steam Engines." The title clearly points to a law not solely concerned with allowing for the recovery of the costs of prosecution and otherwise leaving the options available for taking legal action in order to reduce smoke pollution unchanged. This aspect of the 1821 *Smoke Prohibition Act* does not fit easily with Clapp's assertion that the Act served only to show that Parliament was not in favour of smoke pollution.

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[27] *An Act for giving greater Facility in the Prosecution and Abatement of Nuisances arising from Furnaces used and in the working of Steam Engines (Smoke Prohibition Act)*, 1821. 1 & 2 George IV (1821), c. 41.

Finally, the 1821 Act appears to have successfully encouraged nuisance actions in some areas. In West Yorkshire alone, between October 1821 and January 1823, 34 convictions for smoke pollution nuisances are recorded, all of which involved the imposition of legal costs in addition to fines.[29] Nuisance actions were brought in other than heavy industrial areas too, sometimes with creative results. In August 1822, a Bristol timber merchant called Rankin sued a neighbouring anchor-smiths firm, citing that the defendants "had of late much extended their manufacturing operations, erecting new furnaces, forges, and engines, whereby so much smoke and soot was driven into the deal-yard of Mr. Rankin, that his goods were injured, and his repository rendered untenable." The presiding judge recommended that the defendants adopt a clean-burning furnace, citing a recent precedent:

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[28] Chitty, ed., *Commentaries on the Laws of England: By the late Sir W. Blackstone*, pp. 219-221.

> It was well known that these chimneys could be made to consume their own smoke. He (the learned Judge) recollected a case at Dorchester, of a tallow manufactory, a most intolerable annoyance, the nuisance of which had, by proper arrangements, been completely abated.[30]

After further discussion, the plaintiff agreed to have the defendant take over possession of the yard in question. Thus in this case, the judge's power to encourage options other than legal proceedings helped the parties to come to a workable solution.

Overall, the confident tone of the 1819 and 1820 reports, and the interest in reducing industrial pollution manifested therein by legislators , industrialists and other witnesses before the committees, together with efforts by members of the public who had sought indictments against many industrial polluters are all striking in comparison with the treatment given to the 1821 *Smoke Prohibition Act* in the existing secondary literature. The 1821 law itself only added to the optimism and desire to actively seek reform present in the committee reports. If one considers that in 1819-21 steam engine technology was still relatively new and continually undergoing significant revision and upgrading,[31] the drive to add smoke abatement mechanisms to steam engines in use in so many different industries at this early date most likely reflected a genuine and widespread desire to make clean-burning steam engines and furnaces the universal norm as industrialization proceeded.

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[29] The occupations of the offenders included: spinners, dyers, a machine maker, a carpet manufacturer, iron founders, corn millers, and numerous "labourers". West Yorkshire Archives Services, QS4/56, Sheffield Sessions, October 1821; Pontefract Sessions, April 1822; Sheffield Sessions, October 1822; Doncaster Sessions, January 1823; Wakefield Sessions, January 1823.
[30] *The Times*, 22 August 1822, p. 3, col. E.

The 1821 Smoke Prohibition Act: innovative yet familiar

In addition to the innovative aspects of the *Smoke Prohibition Act* described above, the Act also retained several key aspects of common law nuisance that would have been familiar to those involved in the smoke debate in a legal capacity. As shown in chapter one, to be actionable under the law, smoke pollution had to be proved to have harmed the property or health of others. This principle continued to shape the perception of such pollution in the early industrial revolution period and was retained in the 1821 Act. This understanding of pollution in terms of nuisance law—as an action by one party unreasonably harming the property or health of others—is reflected in the testimony before the 1819 and 1820 Select Committees on Smoke Prevention.

In reading the testimony before the 1819 and 1820 Select Committees, it becomes clear that many of those who were concerned about the smoke problem had become interested in it above all due to their personal experiences of being annoyed by smoke pollution, or of having been the victims of a nuisance. Some witnesses had suffered annoyance with respect to the use of their houses or industrial premises, while others described being afraid of the complaints of their neighbours which could lead to nuisance indictments. In all cases, the harm caused by the actions of alleged polluters to their neighbours was the measure by which local authorities determined whether or not pollution had occurred.

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[31] Before the 1819 Committee, building surveyor Joseph Gregson emphasised the newness of the widespread use of steam engines and the consequent problem of industrial pollution when he commented that in Liverpool, smoke nuisances "altogether appeared within the last twenty years". Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. *BSP* 1819, VIII, p. 275.

For example, the Committee's Chair, Michael Angelo Taylor, gave a lengthy testimonial to the effectiveness of Birmingham worsted manufacturer and inventor Josiah Parkes's smoke abatement equipment, in which he mentioned the damage to his personal property he had long suffered as a result of smoke pollution:

> On going into Mr. Parkes's premises I could not perceive the least smoke arising from any chimney in the place, so much so that I was at a loss to ascertain which was the chimney attached to the furnace which supplied the heat for the steam engine. I also noticed very accurately the garden which immediately adjoined the furnace, to see if from the flowers and from the different plants that were in that garden there was upon them the affection of soot or smoke; I could perceive none, though I inspected them very narrowly; I was anxious to make this trial, knowing from experience that the volumes of smoke which issue from the furnaces on every side of the rives Thames opposite my own house, actually blacken every flower I have in my own garden at Whitehall.[32]

Taylor was not himself a factory owner, but several other committee members were and a number of these members, despite owning works that emitted smoke, admitted to having been hurt by smoke pollution from neighbouring factories. Henry Monteith, for example, a member of the committee and the Provost of Glasgow who also owned a number of steam engines, mentioned that he favoured smoke abatement practices along the lines of those developed by Josiah Parkes and thought they would greatly benefit his native city of Glasgow. He asserted that the problem of smoke pollution "is certainly a very public nuisance in Glasgow", and he was able to back this up by mentioning his own suffering resulting from it: "I have steam-engines myself at a considerable distance [from Glasgow], and works, which are injured by the smoke; and if it proves as efficacious there as it appears it would, it would prove a benefit to myself."[33]

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[32] Report from the Select Committee on Steam Engines and Furnaces &c. 5 July 1820. *BSP* 1820. II. p. 244.

Josiah Parkes, whose premises Michael Angelo Taylor visited, had a similarly personal experience of smoke pollution. He testified that his family's business had used steam engines for approximately twenty-five years, and that due to the "inconvenience from the smoke of the furnaces that heated the boilers of the steam engine", they had "practised methods for reducing our smoke for some years". The problem of smoke had become more serious in recent years, however, because they had begun bleaching cloths on their drying ground which lay very close to their mill that contained the steam engines. As a result, he and his family "were greatly annoyed by the smoke, and directed our attention to its entire removal."[34] Parkes's testimony is especially interesting because his own family's worsted factory's furnace produced the soot and smoke that hurt their cloths laid out in their drying ground. The evidence of the effects of smoke pollution in this case was of the most immediate kind, the polluters and victims being one and the same.

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[33] Report from the Select Committee on Steam Engines and Furnaces &c. 5 July 1820. *BSP* 1820, II, p. 245.

[34] Report from the Select Committee on Steam Engines and Furnaces &c. 5 July 1820. *BSP* 1820, II, p. 239.

A very similar example was given by another witness, William Moult, who mentioned that the man for whom he erected two of his smoke-consuming boiler furnaces owned a house near his manufactory which he lived in whenever he was in that area. The owner was annoyed by the smoke from his own premises, which prompted him to install clean burning furnaces. Moult testified to the success of his work: "The smoke, when the wind was in a particular direction, used to annoy the house; but after the furnaces were altered, it was found to be very little annoyed by the smoke."[35]

Other factory owners sought to curb their smoke emissions in order to avoid legal action by their neighbours. William Phipson, the owner of a rolling mill with two steam engines, testified that he had adopted smoke abatement equipment that had helped reduce his factory's smoke emissions partly because of "the frequent complaints of my neighbours" and the fact that he was "indicted for a nuisance" on one occasion.[36] Although in this case Phipson was himself the offender, the situation was much the same as the other examples. The suffering caused to individuals from neighbouring industrial premises formed the basis for nuisance prosecutions.

As a whole, this emphasis on personal suffering was in keeping with the common law conception of nuisance, under which an offender's actions had to be shown to have hurt the property or the health and comfort of others. So too was the fact that they felt it necessary to describe these experiences—the negative experiences resulting from the actions of others—to the committee in order to establish the fact that industrial smoke emission had in fact become an activity that amounted to nuisance. In legal terms, this constituted a reactive approach to fighting pollution, in which action was only taken once a nuisance had been created, in keeping with common law practices.

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[35] Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. *BSP* 1819, VIII, p. 277.
[36] Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. *BSP* 1819, VIII, p. 241.

To sum up, the 1821 *Smoke Prohibition Act* combined innovative aspects with the familiarity of common law precepts. Its acceptability to those aiding in its creation is reflected in the fact that it passed without difficulty. In later decades this approach would be challenged, and attempts made to impose a generally applicable smoke prohibition or ban. Yet in 1821, the legal regime available to aid in the attempt to curb industrial smoke pollution remained rooted in established common law remedies. This was due, in large part, to the perception that these remedies were effective, as well as to unwillingness to tamper with the rights embodied in the common law regime such as the right to a jury trial, and to the perception of smoke pollution as a social problem that could be easily and economically achieved.

Why such initial support for national smoke pollution legislation?

The question then arises of why smoke pollution legislation received so much attention and support at this particular time. If common law remedies were considered adequate, why would legislators feel the need to emphasize their existence and encourage their usage with a new national smoke law? Awareness of the problem of industrial smoke pollution in the early industrial revolution period was noted above, but this was also the putative age of "laissez-faire", in which compulsory governmental regulation of social, economic, and environmental matters was increasingly frowned upon. One must ask, what, then, made this law readily acceptable? This section will explore the question of why, between 1819 and 1821, there was such widespread support for the legislation enacted in 1821, the *Smoke Prohibition Act*.

This section will argue that in the period 1819-1821, a number of strands of thought influenced legislators and industrialists. "Laissez-faire" thought, as articulated by classical political economists, did play an important role in the creation of the *Smoke Prohibition Act*, by fostering support for it, rather than encouraging a lack of regulation, as so many historians argue. Classical political economy encouraged improvement, by individual industrialists, of industrial technologies, investment by capitalists of their profits for the purposes of improvement, and belief in greater profitability through improvement. Moreover, in 1819-1821, "laissez-faire" thought combined with two other factors to produce historical conditions in which an unlikely alignment of legislators and industrialists favoured, and successfully created, national smoke pollution law. First, the unprecedented scale of industrialization, and consequently of industrial pollution, prompted concerns about the safety of people's property and health as well as raising questions about the effectiveness of the existing common law legal remedies. Secondly, the primary source material examined in this chapter reveals that in this period there was widespread concern for resource conservation among both legislators and industrialists. This concern was more typical of an older, pre-industrial understanding of natural resources and their scarcity, as population grew to put pressure on the pre-industrial economy. Yet it persisted into the early industrial period because of the ecological constraints that helped initially to spark industrialization, and led early industrialists to seek ever greater technological efficiency in order to reduce industrial waste. The "laissez-faire" thought of this period should be viewed in the context of such reactions and attitudes to industrialization. Support for the 1821 *Smoke Prohibition Act* thus stemmed from the combination of optimistic economic thought with concerns for public safety and resource conservation among legislators and industrialists witnessing the profound changes environmental and social changes accompanying industrialization.

Pollution, resource conservation, and industrialization

The support demonstrated for smoke pollution legislation in 1819-1821 and the consequent success of the 1821 *Smoke Prohibition Act* were by no means inevitable. The perception of, and attitudes toward, industrial smoke pollution among legislators and industrialists in this early period must be viewed in terms of their relationship to the nature of industrialization. Two aspects of the historiography of the industrial revolution in particular are of importance: first, the origins of industrialization and, secondly, the motivations leading the people who became early industrialists to pursue industrialization.

Historians remain divided over what sparked the vast changes in industrial production, labour organisation, and social change of the late eighteenth and early nineteenth centuries that formed the industrial revolution. The earliest writers generally argued that industrialization emerged in Britain in the late eighteenth century owing to the invention of new, mechanized technologies, which themselves were made possible by increased agricultural productivity or extensive capital accumulation. In this view, as producers became able to produce more and more goods, demand for those naturally grew as national wealth increased, and in this way Britain's industrial economy became self-sustaining.[37]

Numerous historians have critiqued various aspects of these techno-centric, supply-side interpretations of the origins of industrialization. Some have pointed out that sustained economic growth did not begin until well into the nineteenth century.[38] Others have questioned the infinite elasticity of demand as mechanization accelerated the pace and range of goods made available for sale, and point out that many inventions and innovations did not immediately stimulate increased demand but rather took decades to take off.[39] Alternatively, the uneven pace of invention in the late eighteenth and early nineteenth centuries has also led some historians to question the argument that the informal development of a culture of inventiveness was a strong enough factor to account for the extent of change seen over the industrial revolution period.[40]

Among these critiques, a convincing argument, made by scholars such as Richard Wilkinson and G. N. Von Tunzelmann, emphasises the role of resource scarcity. These writers argue that the onset of industrialization was fuelled primarily by ecological constraints and economic imperatives. The widespread changes in resource use—for example from charcoal to coal fuel, and from organic raw materials to more abundant inorganic raw materials such as the development of the LeBlanc process for making alkali from salt rather than from sea plants—developed in response to severe shortages of the traditional primary materials. As Wilkinson argues, "[t]he initial stimulus to change came directly from resource shortages and other ecological effects of an economic system expanding to meet the needs of a population growing within a limited area."[41]

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[37] A. Toynbee, *The Industrial Revolution* (Boston, 1956); T. S. Ashton, *The Industrial Revolution* (London, 1948); D. Landes, *The Unbound Prometheus* (Cambridge, 1969).

[38] N. F. R. Crafts, *British Economic Growth During the Industrial Revolution* (Oxford and New York, 1985); J. C. D. Clark, *English Society, 1660-1832* (Cambridge and New York, 1985).

[39] R. G. Wilkinson, "The English Industrial Revolution", in D. Worster, ed., *The Ends of the Earth: Perspectives on Modern Environmental History* (Cambridge, 1988); G. N. Von Tunzelmann, *Steam Power and British Industrialization to 1860* (Oxford, 1978); C. K. Hyde, *Technological Change and the British Iron Industry 1700-1870.* (Princeton, 1977).

[40] J. Mokyr, "Demand vs. Supply in the Industrial Revolution", *Journal of Economic History* vol. 37, no. 4 (Dec. 1977), pp. 981-1008.

Within this ecological argument, the saving of resources and the improvement of technological efficiency, and their connection to concerns over conserving resources, have been examined by several historians. With respect to steam engines and coal use, in his economic analysis of the rise of steam power, Von Tunzelmann emphasises the attempts made by early industrialists to improve the performance and efficiency of steam engines. His economic analysis of the rise of coal use in the industrial revolution demonstrates the extent to which the innovations with respect to steam power developed in this period comprised a series of attempts to increase the efficiency of the Newcomen steam engine. He dates this progression to the work of James Watt (who patented his own smoke prevention technology in 1785), and argues that many other important improvements, such as the high-pressure condensing engine developed in Cornwall by mining experts but soon adopted in the Midlands and the Northwest, were created with the same goal of increasing the output of steam engines while conserving fuel.[42] Ben Marsden offers a similar portrayal of the career of James Watt, arguing that his work on steam engines was dominated by his desire to make the engines more economical by eliminating waste of all kinds.[43] H. W. Dickinson points out that when Watt invented the separate condenser to add to Newcomen's engine, "at one bound he effected a saving of almost 75 per cent in fuel."[44]

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[41] R. G. Wilkinson, "The English Industrial Revolution", in D. Worster, ed., *The Ends of the Earth: Perspectives on Modern Environmental History* (Cambridge, 1988), p. 80.

This argument is compelling with respect to the development of smoke pollution law, because in the period 1819-1821 the industrialists who testified before the Select Committees on Steam Engines and Furnaces displayed a significant level of concern for resource conservation. Although industrialization certainly required the harnessing of new, vastly more abundant primary materials, and those involved in the smoke pollution debate were aware of the harmful effects of excessive industrial smoke emissions, at this early period people intimately involved in industry did not appear to view resources, in this case coal fuel, as infinitely abundant. Instead, they thought about smoke pollution largely in terms of its relationship to resource conservation, in a more traditional, pre-industrial manner in keeping with the interpretations of Wilkinson, Von Tunzelmann and others.

Both the legislators and industrialists involved in the smoke pollution debate clearly understood that industrial smoke was harmful. Like the rest of the population, they were struck by new scale of smoke pollution. By the late eighteenth century, as England approached its ecological limits as an advanced agricultural society, commerce and industry grew at unprecedented rates. Urbanisation and industrialization led to the proliferation of factories and other industrial premises in new populated areas. Industrial pollution, even before steam power became widespread, therefore became more noticeable to greater numbers of people, and complaints grew both in literature and in terms of legal action taken to curb such pollution. In November 1818, a few months before the first Select Committee on Steam Engines and Furnaces was convened, the author of a letter to *The Times* complained about the smoke pollution plaguing London and appealed to "some spirited member of Parliament" to seek a legal solution to the problem. He expressed great surprise at the sheer amount of smoke pollution, and the fast pace at which new industrial premises were being built in and around London:

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[42] G. N. Von Tunzelmann, *Steam Power and British Industrialization to 1860* (Oxford, 1978), chapter 2 and conclusion.
[43] B. Marsden, *Watt's Perfect Engine: Steam and the Age of Invention* (Cambridge, 2002), pp. 10, 124.
[44] H. W. Dickinson, *A Short History of the Steam Engine* (London, 1963), p. 66.

> We cannot but be astonished at the supineness of numbers, whose valuable properties are, beyond all conception, deteriorated by the encroachments of these dreadful nuisances of yesterday. Let any person view from one of our bridges, a *part* only of the chimnies already erected, and daily rising around him; and then, if he can, let him calculate the ruinous havoc committed by their sooty exhalations, on our furniture, our buildings, and our health. Not a house is exempt from their pollution; and ere long our palaces in Westminster, and the humblest abodes in Whitechapel, will alike assume the blackness of the workshops in Birmingham and Sheffield.[45]

Similar concerns were articulated by the industrialists who testified in 1819 and 1820. The Select Committee Chairman, Michael Angelo Taylor, for instance, repeatedly referred to the "dense ebullitions of smoke, which made the air large places so unhealthy, and propagated fever and disease…"[46] Speaking before the 1819 Select Committee, building surveyor Joseph Gregson emphasised the newness of the widespread use of steam engines and the consequent problem of industrial pollution when he commented that in Liverpool, smoke nuisances "altogether appeared within the last twenty years".[47]

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[45] *The Times*, 30 November, 1818, p. 3, col. A.

[46] Hansard, *Par'l. Deb.*, 2nd Series., vol. 1, 2 May 1820, col. 50.

They were also well aware that industrial smoke pollution was considered harmful enough to constitute an actionable nuisance under the common law, as several of them had been indicted for nuisance and several others complained about their property being harmed by smoke (as discussed earlier). In addition, the industrialists who, in 1819 and 1820, discussed their attempts to abate their smoke through the invention or adoption of new equipment, were equally interested in saving coal fuel. They perceived smoke prevention as a useful improvement to industrial processes that would provide them with significant fuel savings. Even smoke itself was characterised as waste, since the dark, sooty component of it was largely composed of unburned coal particles.

This desire for fuel economy runs throughout the testimony of the witnesses before the 1819 and 1820 Select Committees. Throughout the Select Committees' proceedings, almost all of the witnesses and Committee members placed great emphasis on the savings of fuel they believed would result from the implementation of smoke consuming technologies. Several of them also characterised industrial smoke as wasted fuel, and thus in seeking to reduce smoke pollution they sought to minimize waste and conserve coal fuel.

To begin with, their testimony reveals that fuel conservation had been a concern to industrialists for decades prior to the passage of the *Smoke Prohibition*

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[47] Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. *BSP* 1819, VIII, p. 275.

Act, 1821. John Wakefield, renowned for his smoke consuming equipment at this time, claimed to have begun building smoke consuming equipment 30 years earlier. He explained that his employer had sought to avoid offending his neighbours with his industrial activities: "A Mr. Drinkwater had then erected the first mill that was built for mule-spinning in England, in a populous part of Manchester; he did not wish to be offensive to his neighbours there." However, his first attempt (for which he sought the help of Bolton and Watt since it was one of their engines he was trying to fix) was not successful because it "consumed a part of the smoke, but it took more coals by ten per cent. than the old mode." His next attempt in 1817, however, proved successful. This time, he stated, "[m]y principle was applied, which saved him twenty-five per cent. in coal, and consumed the smoke completely…"[48] For Wakefield, therefore, smoke abatement and fuel savings were equally important indicators of the success of his invention.

Other witnesses placed similar emphasis on the savings of fuel accruing from the installation of smoke abatement equipment. Mr. James Scott Smith, a "rectifying distiller" at the Whitechapel Distillery, applied a smoke consuming apparatus—a "fire regulator" designed by William Brunton—to a malt distillery on neighbouring premises, and although the apparatus did not entirely eradicate the distillery's smoke emissions, he felt that it was still a worthwhile venture because of several other benefits it offered. When asked about the efficacy of Brunton's equipment, Smith replied that,

> We have found that we can consume the smoke to a very great extent, and although it is not completely invisible, yet it is never offensive; we

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[48] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820. II, p. 249.

> never have any of those dark volumes of smoke which are the cause of so much complaint. I have never understood that it is possible to consume the smoke entirely; and I believe there is no plan or apparatus which professes to do so.[49]

Despite these less than perfect results, Smith nonetheless felt the installation of Brunton's invention was a positive improvement:

> The fire-regulator invented by Mr. Brunton has many advantages; 1st. The boilers to which it is attached have their power greatly increased, will last a longer time, and will not be so liable to leak as those on the old plan, which arises from the circumstance of the fire-door not being opened to introduce the fuel, consequently the frequent draughts of cold air are excluded; and the boilers retain an uniform temperature. 2ndly. There is a great saving of fuel, viz. 38 per cent., and this is the average of a three weeks experiment with the fire-regulator, compared with the work of three men in a three weeks experiment on the old principle.[50]

The testimony of the most prominent witness (thanks to his famous smoke consumption invention), the Warwick worsted manufacturer Josiah Parkes, reveals that smoke abatement was at times treated as an aspect of fuel economy, rather than the sole goal in and of itself. Parkes had invented his smoke consumption apparatus after witnessing the harm caused to their property by the smoke of his own family's steam engines. Yet even he, who claimed to have been initially motivated purely by the goal of eradicating smoke pollution, considered fuel conservation to be a necessary aspect of his invention. When asked by the Committee, "[w]hat saving has taken place in the article of fuel by the change which you have made in your furnace", Parkes replied that "[w]e have reduced our consumption of coals by the combined adoption of the mode of firing with the destruction of smoke from thirty-six hundred weight to twenty-five hundred weight daily."[51] In this case, once again, fuel economy was clearly considered to be as desirable an outcome as smoke prevention.

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[49] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820. II, pp. 247-248.
[50] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820. II, pp. 247-248.

Even witnesses who could not yet precisely gauge the savings stemming from the installation of smoke abatement equipment expressed confidence that fuel conservation would result from the alterations made to their furnaces. Frederick Perkins, a partner in the Barclay, Perkins & Co. brewery in London, was asked about the equipment installed for them by Josiah Parkes. The Committee asked him to clarify his position on fuel savings: "You have said, you are convinced that there cannot be any increase in the consumption of fuel?" Perkins restated his optimism while at the same time admitting that he could not yet calculate the savings in his own furnaces: "Certainly; but we cannot say what the decrease is, because our fires have been continually disturbed on account of persons coming down to see it."[52] Overall, therefore, savings in fuel appear to have been widely believed to be a realistic added benefit of the attempts made to curb industrial smoke pollution.

This early interest in environmental regulation appears to have arisen in part from the overlapping of an advanced agricultural economy with the beginnings of the first industrial society. William Stafford, for instance, argues that in the late eighteenth and early nineteenth centuries, Britain suffered exceptional economic instability due to the overlapping uncertainties of both the pre-industrial economic fluctuations caused by the varying quality of harvests and of the new industrial economy moving "in accordance with the trade cycle of boom and slump".[53] With respect to environmental issues, a fundamental characteristic of an advanced agricultural society is great concern about resources and resource conservation. This is because such societies have approached the upper limits of their capacity to supply their populations with the goods needed for survival, or, in other words, have come close to the upper limits of their productive capacity and per capita productivity. From at least the first half of the eighteenth century, observers noted shortages of resources in industrial areas. Timber shortages, for instance, were noted as early as the 1720s.[54] Concerns about resources abound in the public general statutes of the late nineteenth and early nineteenth century touching on such things as timber supplies, fisheries, and enclosure of common grounds. These same concerns appear to have continued to remain central to industrialists in 1819-1821. Although England undoubtedly did cross a crucial threshold with industrialization, one that ultimately allowed the country to break through the Malthusian constraints of an agricultural society and to become the "workshop of the world" within a generation, in these early years the industrialists involved in the smoke pollution debate held a distinctly pre-industrial attitude toward natural resources. For the most part they favoured smoke pollution law and were highly concerned with saving fuel and reducing waste within their factories and industrial processes.

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[51] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820, II, p. 240.
[52] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820, II, p. 242.

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[53] W. Stafford, *Socialism, Radicalism, and Nostalgia: Social Criticism in Britain, 1775-1830* (Cambridge, 1987), p. 22.

[54] A treatise on the industries found in Hartz Forest, one of King George II's German holdings noted that, "[t]here were formerly three Glass-houses in the Hartz, but by reason of the consumption of Wood, which is grown more scarce of late, there is but one left." H. Behrens, *The Natural History of Hartz-Forest, in His Majesty King George's German Dominions.* (London, 1730), ch. 1. In his *Tour Through Great Britain* (1724), Daniel Defoe mentioned a similar problem in Sussex, where forests were used to provide timber for charcoal for the iron industry and where Defoe noted the price of wood. Mentioned in G. D. H. Cole, *Persons and Periods: Studies* (New York, 1969), p. 27. It is interesting to note that Theodore Steinberg notes a very similar strain on natural resources, which he terms a "Malthusian crunch" in New England by the 1720s. T. Steinberg, *Down to Earth: Nature's Role in American History* (New York and Oxford, 2002), pp. 43-44.

The rise of capitalism with respect to environmental attitudes

The second aspect of industrial revolution historiography that is of importance to the historical development of smoke pollution law is that of the changing nature of the relationship between humans and the natural world. Industrialization is seen by many historians to have brought with it a new perception of natural resources as abundant and no longer requiring strict regulation and conservation. Many environmental historians view industrialization as a crucial turning point in the history of the relationship between humans and the natural world. The process of harnessing new power sources and new kinds of raw materials is said to have contributed to a new, exploitative approach to nature and natural resource use. As Theodore Steinberg argues, for instance, the rise of industrial capitalism was premised on a process of "commodification" of nature. This meant that, "[b]y conceiving of such things as water and trees as commodities, rather than as the face of nature, and putting a price on them, it became possible to efficiently manage and reallocate what had now become resources."[55] The result of the growth of industrial capitalism, Steinberg asserts, was "a systematic effort to control and master nature."[56] E. P. Thompson argues that this greed and exploitative attitude common to industrial capitalists was experienced by the working poor in the form of "intensified exploitation, greater insecurity, and increasing human misery."[57] In this light, an interpretation of the 1821 *Smoke Prohibition Act* similar to that of Brian Clapp is not surprising. Clapp argues that early industrialists "were careless in the use of coal" and that the 1821 *Act* "… added little if anything to substantive law and simply served to state that Parliament was against smoke, rather than for it."[58] Widespread interest at this time among both industrialists and legislators in seeking something as progressive as smoke abatement law is unexpected, given historians' assumptions concerning attitudes toward the expoloitation of resources.

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[55] Steinberg, *Down to Earth: Nature's Role in American History*, p. 55.
[56] T. Steinberg, *Nature Incorporated: Industrialization and the Waters of New England* (Cambridge and New York, 1991), p. 12.

By contrast, the testimony of the parliamentary Committees suggests that the industrialists who were examined in 1819 and 1820 were far from "careless" in their use of coal fuel. The desire to conserve fuel and render their furnaces more efficient was the most universal theme of the findings of the Select Committees on Steam Engines and Furnaces. One is led, therefore, to question the development of the new commodifying, exploitative attitude that Steinberg and others so convincingly describe. This means that one must, by extension, question the role played by the rise of capitalism in this early industrial period.

The rise of capitalism undoubtedly played a very important role with respect to England's economy as it grew increasingly commercial, stratified, urbanised, and finally industrialized.[59] However, one must recognise that "capitalism" neither was nor is a monolithic entity. Instead, there were various schools of capitalist thought even within the industrial revolution period itself. The attitudes and beliefs displayed by both the legislators and industrialists seeking smoke abatement law fit closely with the dictates of classical political economy. Classical political economic thought did not advocate impersonal exploitation and greed to the point of immiserization of whole sectors of the population. Rather, it was premised on optimism, willingness to attempt individualistic improvements and innovations, and the belief that national wealth could increase in aggregate terms. It is this form of capitalism that is reflected in the testimony of the industrialists speaking before the 1819 and 1820 Select Committees. Only decades later, with the development of neo-classical economic thought did economic theory grow to resemble the industrial capitalism described by Steinberg, Thompson, and many other historians.

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[57] E. P. Thompson, *The Making of the English Working Class* (London, 1991 [1963]), p. 231.

[58] Clapp, *Environmental History of Britain since the Industrial Revolution*, pp. 19, 32.

[59] S. B. Clough and C. W. Cole describe capitalism as it emerged in this period as system in which "[c]ommercial relationships were no longer based primarily upon barter but upon a money economy", and they argue that the foundational rule of the system was "to charge all that the traffic will bear", in contrast to older notion of fair trade and fair prices. S. B. Clough and C. W. Cole, *Economic History of Europe* (Boston, 1952), p. 373.

Classical political economists, in the second half of the eighteenth and early nineteenth centuries, including David Hume, Adam Smith, David Ricardo, and Thomas Malthus, sought to discover the laws which they believed governed a capitalist, market economy. To appreciate the revolutionary changes in the understanding of a national economy encouraged by the spread of classical political economic thought, however, it is necessary to consider the preceding dominant body of economic thought which Adam Smith sought to displace, that of mercantilism.

Mercantilism and classical political economy both dealt with macro-economic questions, or questions relating to the development of the wealth and prosperity of the nation as a whole.[60] The key determinant of a nation's wealth according to mercantilist thought was the amount of precious metal held within the country. Throughout the seventeenth and early eighteenth centuries, French and English rulers, along with those of many other European nations, sought to import more precious metals than they exported, so that their country would enjoy a positive balance of trade. In addition, mercantilists believed that the world contained a finite amount of wealth, so that a negative balance of trade would lead to the economic decline of a nation in relation to its rival nations.[61] This fear led them to create detailed systems of economic regulation which encouraged the import of cheap raw materials, the development of domestic industry, and the export of expensive finished goods. In this way, the amount of money leaving the country to buy raw materials would always remain lower than the amount of money entering the country to pay for the manufactured or otherwise finished exports. English economic and foreign policy was dominated by mercantilistic thought until well into the eighteenth century;[62] however, the most systematic development of mercantilistic policy occurred in France under Jean-Baptiste Colbert, minister to Louis XIV in the 1660s and 1670s.[63]

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[60] E. E. Rich and C. H. Wilson, *The Cambridge Economic History of Europe, vol. V, The Economic Organization of Early Modern Europe* (Cambridge, 1977), pp. 16-17, 573-588.

This approach to macro-economic policy proved problematic in several ways, however. Foremost was the fact that when a country imported more precious metal, or money, than it exported, the prices of goods were pushed upward (i.e. inflation occurred). This hurt the country's exports by pushing their prices upward to such an extent that fewer other countries were willing to buy them. This aspect of mercantilist policy was attacked in France by a group of French economists called the Physiocrats, who argued that the true source of a nation's wealth lay in its agricultural production.[64] They rejected the notion that the accumulation of precious metal, through the centralised encouragement of industry, fostered national prosperity, and instead argued that agriculture should receive more protection and financial incentives than industry.

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[61] Rich and Wilson, *Cambridge Economic History of Europe, vol. V, The Economic Organization of Early Modern Europe*, pp. 573-574; Clough and Cole, *Economic History of Europe*, chs. 7, 8.
[62] Clough and Cole, *Economic History of Europe*, pp. 345-351.
[63] In 1670, Colbert wrote to Louis XIV that, "[v]u que n'y ayant une même quantité d'argent qui roule dans toute l'Europe … il est certain et démonstratif que l'on ne peut parvenir à l'augmenter … qu'en même temps l'on en oste la même quantité aux Etats voisins." ("Seeing that there is only one quantity of silver that circulates through all of Europe … it is certain and demonstrable that one can only increase it … by at the same time removing the same amount from neighbouring states." [my translation]), quoted in *F. Bayard and P. Guignet, L'économie française aux XVI^{e}, XVII^{e} et XVIII^{e} siècles* (Paris, 1991), p. 63; Rich and Wilson, p. 579; J.-C. Asselain, *Histoire économique de la France du XVIII^{e} siècle à nos jours, tôme 1, De l'Ancien Régime à la Première Guerre mondiale* (Paris, 1984), p. 76.

English economic writers also grew to reject mercantilistic thought in the eighteenth century. David Hume was also among the earliest writers to articulate and criticise the problematic aspect of mercantilism concerning the elasticity of demand.[65] In his *Political Discourses* (or *Political Essays*) (1752), he asserted that elasticity of demand must be taken into account, so that increased prices of exports must be understood to pose a danger as the demand among foreign purchasers for English exports would decline if prices rose excessively.[66]

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[64] R. L Meek, *The Economics of Physiocracy: Essays and Translations* (London, 1962), p. 20; R. Grandamy, *La Physiocratie: Théorie générale du développement économique* (Paris, 1973), pp. 10-11. Jean Cartelier notes that François Quesnay, one of the founding Physiocrats, envisioned France's rise to a wealthy status through the establishment of a "royaume agricole". F. Quesnay, *Physiocratie: Droit naturel, Tableau économique et autres textes,* édition établie par Jean Cartelier (Paris, 1991), p. 12.

[65] M. Blaug, *The History of Economic Thought* (Aldershot, 1990), p. 22.

[66] In his essay "Of Commerce", Hume wrote that, "…the English feel some disadvantages in foreign trade by the high price of labor, which is in part the effect of the riches of their artisans as well as of the plenty of money." See C. W. Hendel, ed., *David Hume's Political Essays* (Indianapolis and New York, 1953), p. 139. As Didier Deleule explains, Hume argued that, "lorsque la nation entretient des relations commerciales avec l'extérieur, l'accumulation du stock métallique rencontre des limites inévitables : le premier effet de l'accroissement du stock est l'élévation des prix, hausse qui rendra vite difficile, voire impossible, la lutte contre la concurrence extérieure." See D. Deleule, *Hume et la naissance du libéralisme économique* (Paris, 1979), p. 147.

Marc Blaug argues that Hume's assertion on this point "rang the death knell of mercantilism" and that the concept of elasticity of demand was crucial to the development of classical political economy.[67] This was because it encouraged a movement away from the bullionist approach of mercantilism (the belief in the accumulation of precious metals) and toward analysis of the effects of inflation on prices and interest rates, and led to arguments in favour of eliminating trade barriers imposed by the government so that the prices and exchange values of goods could fluctuate in accordance with demand, thereby enabling the national economy to remain internationally competitive on a long-term basis.

Hume parted from the Physiocrats on the question of the relative importance of agriculture versus industry to a national economy. He continued, like the Physiocrats, to view agriculture as the fundamental source of national wealth, but only because it made industry possible. He argued that wealth was accumulated when agricultural productivity increased to such an extent that excess labour could be released from agriculture and applied to manufacturing. As Hume explained,

> When a nation abounds in manufactures and mechanic arts, the proprietors of land, as well as the farmers, study agriculture as a science, and redouble their industry and attention. The superfluity, which arises from their labour, is not lost; but is exchanged with manufactures for those commodities, which men's luxury now makes them covet. By this means, land furnishes a great deal more of the necessaries of life, than what suffices for those who cultivate it. In times of peace and tranquillity, this superfluity goes to the maintenance of manufacturers, and the improvers of liberal arts.[68]

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[67] M. Blaug, *The History of Economic Thought* (Aldershot, 1990), p. 22.

[68] D. Hume, "Of Commerce", p. 11. From D. Hume, *Political Discourses* (1752), ed. E. F. Miller. Indianapolis, IN: Liberty Fund, 1987. Reproduced by The Library of Economics and Liberty, http://www.econlib.org/library/LFBooks/Hume/hmMPL24.html (28 July 2004).

The conception of a capitalist, competitive market economy central to classical political economic thought was most fully articulated by Adam Smith in his *Inquiry into the Nature and Causes of the Wealth of Nations* (first published 1776). Smith adopted a view very similar to that of Hume on the importance of manufacturing. The key point common to Hume and Smith was that national wealth was created by individuals who improved both agricultural and industrial productivity and used the surpluses accumulating from such productivity increases to invest in further productive activities.[69] In this way, overall production would grow, as would the profits reaped by individuals. No longer was the hoarding of precious metals taken from a finite store of global wealth considered worthwhile. Instead, wealth and economic growth were perceived to originate within the nation, and to accelerate as individual entrepreneurs re-invested their profits repeatedly and in ever larger amounts in order to improve their factories and labourers' skills and increase the amount of labour they employed.[70] As Smith explained,

> The uniform, constant and uninterrupted effort of every man to better his condition, the principle from which public and national, as well as private opulence is originally derived, is frequently powerful enough to maintain the natural progress of things toward improvement, in spite both of the extravagance of government, and of the greatest errors of administration. Like the unknown principle of animal life, it frequently restores health and vigour to the constitution, in spite, not only of the disease, but of the absurd prescriptions of the doctor.[71]

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[69] For points of similarity between Hume and Smith, see J. Z. Muller, *Adam Smith in His Time and Ours: Designing the Decent Society* (New York, 1993), ch. 1, pp. 24-25, 57-59. See also S. Hollander, *The economics of Adam Smith* (Toronto, 1973), pp. 77-78.

[70] S. Fleischacker, *On Adam Smith's Wealth of Nations* (Princeton, 2004), ch. 7, esp. pp. 131-134; M. Bowley, "Some Aspects of the Treatment of Capital in *The Wealth of Nations*, in A. S. Skinner and T. Wilson, *Essays on Adam Smith* (Oxford, 1975), pp. 361-369.

[71] A. Smith, *Enquiry into the Causes and Nature of the Wealth of Nations*, Book 2, ch. 3. Quoted from "The Wisdom of Adam Smith" (The Adam Smith Institute), *http://www.adamsmith.org/smith/quotes.htm#jump1* (August 2005).

Smith, like Hume in his discussion of elasticity of demand, also challenged the mercantilistic understanding of the prices of goods. For centuries, commodity prices had been so closely controlled by governments through the granting of monopolies, and the imposition of price controls, tariffs, and subsidies, all of which Smith rejected. Therefore, he proposed a new theory of how goods acquired their price, or exchange value, called the labour theory of value. According to this theory, the exchange value of a good is comprised of the sum of the cost of the wages and rent the producer had to pay to produce the good and the profit acquired by the producer. Smith argued that all of these factors—wages, rents, and profits—had "natural" rates common across societies. The market price received for goods could fluctuate slightly above and below this natural price, but in the long run, producers could expect to be compensated sufficiently in accordance with the natural price of the goods he or she produced and sold.[72]

Therefore, Smith did not see competition as a potential danger to producers that could easily push prices too low to be sustainable. Rather, his description of a competitive market economy was a highly optimistic one, in which producers could anticipate an adequate and just return on the investments they put into improving their production techniques. A similarly positive and optimistic view of economic stability and growth can be seen in the testimony of those involved in the drafting of the 1821 *Smoke Prohibition Act*.

When discussing his proposal for a Select Committee to draft smoke abatement legislation in the House of Commons in 1820, Michael Angelo Taylor described measures to curb industrial smoke as "improvements" rather than as sacrifices or burdens to be imposed by government on industrialists. He, along with the other Members of Parliament who favoured the striking of a committee to look into the problem of industrial smoke, further argued that such an improvement, once widely known , would likely be voluntarily adopted on a large scale by industrialists willing to invest in ways to improve the performance, and thereby the profitability, of their works. Taylor first expressed confidence that smoke abatement was so easily achievable that industrialists would happily attempt it if they were made aware of this fact: "If gentlemen would take the trouble of attending to its suggestions, they would find substantial reasons to be satisfied that such a very desirable improvement could be both easily and promptly effected."[73] He then stressed that such improvement could be effected "without injury to the persons engaged in business connected with these steam engines" and, additionally, "with a less consumption of fuel by one-fourth." The Members of Parliament who supported Taylor's idea felt confident that once industrialists were made aware of the benefits to be reaped from seeking to prevent smoke pollution, they would seek to install smoke abatement equipment voluntarily. As Mr. Denman confidently asserted, "[h]e had no doubt that the public knowledge of the thing would of itself be sufficient to introduce the improvement into general practice, without the necessity of recourse to a declaratory law."[74] Sir C. Mordaunt concurred, speculating that smoke abatement plans would "…be generally adopted as soon as it was generally known."[75]

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[72] J. Oser and S. L. Brue, *The Evolution of Economic Thought*, 4th edition (San Diego, 1988), pp. 74-75.

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[73] Hansard, *Parliamentary Debates*, 2nd Series, vol. 1, 2 May, 1820, col. 50.
[74] Hansard, *Parliamentary Debates*, 2nd Series, vol. 1, 2 May, 1820, col. 52.

Such an optimistic view is understandable in light of the fact that so many industrialists appear to have installed smoke abatement equipment on their premises before the passage of the 1821 *Smoke Prohibition Act* and with reports of success. Taylor's assertions were backed up by most of the witnesses before the 1819 and 1820 Select Committees, the testimony of whom revealed that many industrialists had in fact already voluntarily attempted to invent and adopt smoke abatement technologies. These attempts were perceived to be progressive improvements that would provide various economic benefits, including fuel economy, in addition to smoke prevention.

Not only did several witnesses take up smoke prevention projects, but a number of them also mentioned that they were aware of many other firms that had adopted similar equipment. In 1819, for instance, Joseph Gregson, a building surveyor, stated that he had seen steam engines equipped with smoke abatement apparatus at six different industrial premises.[76] Similarly, William Losh, an industrialist from Newcastle-Upon-Tyne with 20 years of experience in smoke prevention,[77] stated that he had installed his apparatus at three different sites in

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[75] Hansard, *Parliamentary Debates*, 2nd Series, vol. 1, 2 May, 1820, col. 52.

[76] These included one London waterworks, two corn mills in Liverpool and Stafford, a London lead mill, a Salford brewery, and the Medlock Mills in Manchester. Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. *BSP* 1819, VIII, p. 276.

[77] Losh was also a pioneer in the field of synthetic alkali manufacture. He and his partner Lord Dundonald produced soda (calcium carbonate, or alkali) at their Gateshead plant as early as the 1790s. See D. W. F. Hardie and J. D. Pratt, *A History of the Modern British Chemical Industry* (Oxford and New York, 1966), p. 24.

Newcastle, Killingworth in Northumberland, and Durham, as well as "several" sent as far as the West Indies.[78]

The fact that so many people, engaged in a wide variety of trades, voluntarily adopted smoke abatement technologies suggests willingness on the part of industrialists to invest their capital for the sake of improvement, without excessive fears of the burden of the costs. In fact, they repeatedly mentioned how quickly their investment would be repaid in fuel savings. Nor did they display fears of competition beating them out. This was in keeping with the optimism characteristic of classical political economy and the understanding common to classical political economists of the nature of economic growth through investment of capital by individuals in industrial improvement and innovation.

A striking feature of the smoke pollution debate of 1819-1821 is the fact that so many people involved in it, whether legislators, scientists, or industrialists, appear to have been convinced that smoke prevention was technically easy to achieve. This was no longer the case by the 1840s and 1850s, when, conversely, the number of smoke abatement patents grew dramatically. The witnesses before the 1819 and 1820 Select Committees almost unanimously held a highly optimistic view of the possibility of controlling industrial smoke pollution. The harmful component of smoke was believed to consist entirely of coal residue that was released into the atmosphere before being burned fully. There was widespread consensus that smoke could be controlled through simple alterations to industrial furnaces in order to cause more complete combustion of the coal fuel. Equipment for controlling industrial smoke pollution had been patented since at least 1785 when James Watt took out a patent for his "smoke consumption" invention.[79]

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[78] Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. *BSP* 1819, VIII, p. 282.

A particularly interesting witness was George Tuthill, a medical doctor from Soho Square, London. He was asked about the negative health effects of industrial smoke, and although he could not state definitively that such smoke hurt the public's health, he stated that he felt it did contribute to the generally bad London environment. Despite his uncertainty regarding the precise health effects of industrial smoke, he did nonetheless think smoke abatement was a worthwhile goal to pursue, and appears to have studied several smoke prevention plans. He emphasised the ease with which he thought such smoke could be eradicated. When asked how smoke might be abated, he answered that the carbon particles had to be converted into carbonic acid gas (carbon dioxide). This could be done simply and easily, and in a way that would completely eradicate dark smoke:

> I think it can be effected by making the smoke pass through an ignited tube, whilst the combustion of the soot is there assisted by a fresh current of atmospheric air. I see no reason why a simple apparatus may not be so contrived, as to render that combustion complete.[80]

In addition, he asserted that large industrial chimneys would no longer be needed, due to the fail-safe nature of his proposed plan:

> There is no limit to this mode of destroying smoke; and should a plan of this nature be hereafter adopted, chimneys as they are now constructed would be quite unnecessary; a small tube would be sufficient.[81]

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[79] See notes 36, 37 above.

[80] Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. BSP 1819, VIII, p. 283.

[81] Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. BSP 1819, VIII, p. 283.

Similar views of the ease with which smoke could be abated run throughout the 1819 and 1820 testimony. Furthermore, many witnesses reported having experienced success, which likely reinforced the existing confidence in the possibility of eradicating industrial smoke. On the last day of the 1820 proceedings, for example, Josiah Parkes stated that since his last appearance before the Committee, he had installed his equipment at two more industrial premises and had enjoyed "the same unvarying success as at Messrs. Barclays brewery".[82] Moreover, his success was witnessed by several well known scientists:

> … he has had the satisfaction of receiving from many scientific gentlemen of the greatest eminence, who have witnessed the effects of his invention, the most unreserved approbation. Amongst the numerous visitors, he can mention the names of Dr. Wollaston, Sir H. Davy, Mr. Brande, Mr. Children, Mr. William Allen, Mr. Pepys, Sir Geo. Tuthill, Sir Gel. Cayley, &c. all or any of whom he might have requested to attend the Committee, to bear testimony to the truth of the principles he has adopted.[83]

Finally, as mentioned above, Francis Perkins had expressed confidence that his firm would enjoy fuel savings because of the installation of Josiah Parkes's smoke abatement equipment. Later on in the same Committee proceedings, Michael Angelo Taylor followed up and reported that the Barclay and Perkins brewery had enjoyed success:

> He can now state that the diminution of the consumption of fuel, both at the engine and steaming-copper at Messrs. Barclays, fully equals the

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[82] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820, II, p. 251.

[83] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820, II, p. 251. Physician Sir George Tuthill testified that he felt smoke could be prevented. In 1843, Brande spoke before another parliamentary committee on smoke pollution, at which time he asserted that for the purposes of preventing smoke, he felt that, "the principle suggested by Mr. Parkes… attain those objects very perfectly." Report from the Select Committee on Smoke Prevention. 17 August 1843. *BSP* 1843, VII, p. 570.

> expectations he stated to the committee, founded on his experience at Warwick [at Parkes's worsted manufactory].[84]

This belief in the technical simplicity of smoke abatement had largely disappeared by the 1840s, and in these early years it was likely such an entrenched view is attributable at least partly to a lack of applied scientific knowledge—in particular chemical knowledge regarding the components of smoke—among those building and managing furnaces and steam engines. In addition, the optimism and willingness to put money into technical improvements so evident in 1819-1821 likely encouraged this belief in the feasibility of smoke prevention.

One final point with respect to the influence of classical political economy relates to the nature of the 1821 *Smoke Prohibition Act* itself. Confidence in the ability of individuals to make economic choices that would benefit not only themselves but ultimately the entire community is reflected in the Select Committees' decision to draft the 1821 *Smoke Prohibition Act* in the form it assumed. They avoided any statutory requirements that would involve inspectors or enforcement officials who were responsible for seeking out and prosecuting smoke nuisances. Rather, by encouraging usage of existing common law procedures for nuisance, they left the responsibility to take legal action with individuals. This "laissez-faire" approach was deliberately thought out by Taylor. As he explained to the House of Commons in April 1821, he did not want to erode the existing common law regime, but believed that the costs of undertaking legal action had become too high and simply sought to counter that problem rather than to change the way in which pollution was controlled through legal means:

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[84] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820, II, p. 251.

> Hence, the most pernicious nuisances were often tolerated through the inability of those under the necessity of residing in their vicinity to defray the costs of a prosecution. He did not intend to interfere with the existing law as to nuisances, or to withdraw from a jury the power of deciding upon any question of nuisance. Therefore he could not accede to the proposition suggested to him of investing two or three magistrates with the power of promptly inquiring into and suppressing any nuisance of this nature by summary process.[85]

This approach was soon to change markedly, once several other vital factors changed as well, namely the leader of the smoke debate in Parliament, approaches to legislation, and attitudes toward industrial pollution and the possibility of its prevention or eradication.

Conclusion

When compared with several dominant historiographical interpretations of this period, these early years present a very interesting and unexpected picture. Both legislators and industrialists supported national smoke pollution legislation in 1819-1821, and consequently were able successfully to enact the 1821 *Smoke Prohibition Act*. This success resulted from the coincidence of several lines of thought. The people involved in the smoke debate in these years understood that industrial smoke caused previously unseen damage to property and public health, and they believed it was a relatively simple problem to fix technically. Moreover, the problem of smoke pollution was perceived by industrialists largely as a problem of technological inefficiency. Thus as they sought ever greater efficiency within their individual firms, their desire to improve the fuel economy of steam of engines helped spark interest in smoke pollution control. Therefore, the desire to conserve resources combined with an understanding of the negative effects of industrial progress on the health of industrial communities and the belief that industrial smoke could be prevented relatively easily led many people to seek a solution to the smoke pollution problem. The tenets of classical political economy appear to have encouraged people to seek solutions that would provide economic benefits or improvements in the form of greater technological and fuel efficiency, and thereby greater profitability, and these solutions were sought largely through individual initiative and entrepreneurship. As a result, the 1821 *Smoke Prohibition Act* was considered a worthwhile statutory enactment that would encourage technological advances and lead to a consequent reduction in industrial smoke. The new law avoided a compulsory prohibition of smoke pollution, preferring instead to retain the common law emphasis on individual legal action, taken at the initiative of community members. As the attitudes of legislators and industrialists toward industrial smoke, its effects and its prevention changed over later decades, so too did their approach to anti-pollution legislation. These changes will be outlined in the following chapters.

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[85] Hansard, *Parliamentary Debates*, 2nd Series, vol. 5, 18 April 1821, col. 440.

Chapter 3. Changing Local Contexts

Introduction

As industrialization proceeded, the offices of the traditional local authorities that were responsible for overseeing public nuisance prosecutions, in particular justices of the peace and magistrates, gradually became overwhelmed by the large-scale migrations to new industrial areas by manufacturers and workers and the consequent environmental and sanitation crises frequently experienced. By the late 1830s, these local officials had lost many of their established powers due to the far-reaching municipal reforms that began in the 1830s, initiating a long process of adjustment to new forms of local government. It often required decades for the new town councils, which replaced municipal corporations in 1835, to establish committees that dealt with environmental problems. At the same time, some difficulty arose with respect to the enforcement of the 1821 *Smoke Prohibition Act*. This problem, in conjunction with the decline of the local authorities who had pursued nuisance prosecutions, led several local jurisdictions to seek new solutions to the smoke pollution problem.

Within the gap created by the decline of the traditional forms of local government there emerged a new initiative of apparently purely local inspiration, local improvement Acts. This chapter will examine the development of these Acts in order to reveal their importance within the larger smoke debate of the nineteenth century. From the 1820s, some of these Acts, especially those applying to industrial areas, began to contain smoke prohibition clauses. These were the first instances of statutory nuisance provisions enacted to curb industrial smoke pollution. This development marked an important shift from a fault-based legal regime to one based on strict liability, in which polluters were subject to conviction and fines regardless of any mitigating circumstances surrounding the creation of the smoke nuisance. Furthermore, this shift proved influential at the national level, inspiring a drive for a new national smoke abatement Act that began in the early 1840s and lasted for a decade.

Local Indictments

Chapter One described the pre-industrial pollution control regime in England. Local authorities treated smoke pollution as a legal nuisance, and dealt with it in the same way as many other offences of an environmental nature, through nuisance actions. In Chapter Two, it was noted that in the mid-nineteenth century, numerous commentators described the difficulties involved in the undertaking of nuisance actions. Both earlier chapters also revealed that this had not been the case in the early nineteenth century, but it was a situation that developed over the first half of the nineteenth century. One crucial factor contributing to this situation was the decline of the venue in which nuisance indictments were sought, the Courts of Quarter Sessions. This section will trace their decline as a venue for enforcing environmental standards, and their gradual replacement by new town councils and the various committees established to deal with environmental issues.

Several reform initiatives in the 1830s led to a significant redistribution of power at the local level. These began with the *Reform Act* of 1832 and the *New Poor Law* of 1834. The former widened the franchise and gave representation to several newly populated areas, while the latter established a new unit of local administration in the form of poor law unions. These were followed by the *Municipal Corporations Act* of 1835 which redefined the composition of local borough councils.[1] As local government was re-organised, the powers of the justices of the peace and the scope of the Courts of Quarter Session were restricted. As W. R. Cornish and G. Clark explain, justices of the peace "shed many of their general functions in local government."[2] The new law also gave the new town councils the power to take over the provision of public services such as lighting, cleansing, and nuisance removal. However, the Act did not make the provision of public services mandatory, so that it often took decades for new town councils to create the required committees and offices, and success varied greatly from place to place.

An interesting contrast can be seen between Leeds and Bradford, for example, both heavy industrial towns by the mid-1830s. In Leeds, the borough council was reformed following the passage of the *Municipal Corporations Act*, and by 1842 had secured the renowned *Leeds Improvement Act*, which included anti-smoke pollution provisions (to be discussed below). Bradford, by contrast, did not become incorporated as a borough until 1847, and the late 1830s and 1840s saw extensive rioting over numerous contentious issues including the *New Poor Law*, Chartism, and religious disputes.[3]

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[1] The passage of the *Municipal Corporations Act* led to the creation of 178 new boroughs, and the municipal government structure laid out in the Act remained in force until 1974. E. L. Hasluck, *Local Government in England* (Cambridge, 1948). "A Vision of Britain Through Time" http://www.visionofbritain.org.uk/au_ft/status_page.jsp?unit_status=MB (1 June 2005).
[2] W. R. Cornish and G. de N. Clark, *Law and Society in England 1750-1950* (London, 1989), p. 21.
[3] A. Briggs, *Victorian Cities* (Berkeley, 1993), ch. 4, esp. pp. 147-150.

In West Yorkshire, the county administrative unit for both Leeds and Bradford, pollution indictments can be found dating far back into the eighteenth century. Although none dealt with smoke from steam engines, there were indictments alleging pollution of the atmosphere, with butchers the primary offenders. In 1775, for example, a Wakefield butcher was indicted for leaving exposed offal and dung of sheep, which was deemed to have left the air near his premises "greatly corrupted and infected".[4] A few years later, another butcher and grocer were charged together with having built a sewer and dumped offal, entrails, and other waste animal products into it.[5] A similar indictment from 1789 alleged that a Wakefield labourer boiled,

> … divers Quantities, to wit, Twenty pound weight of unsound unwholesome and putrid flesh… and also the Guts Offals Entrails and Excrements of divers Beasts unfit for Mankind to eat by reason whereof divers noisome pestilential and unwholesome smells during the Time aforesaid did thereby arise and the Air there was and yet is thereby greatly corrupted and infected…[6]

There then followed the very large number of smoke pollution indictments (over 30) between 1821 and 1823 described in Chapter Two.[7] These all concerned pollution stemming from the use of steam engines, and appear to have been encouraged by the passage of the 1821 *Smoke Prohibition Act*. By the 1830s, however, pollution indictments were decreasing at the West Yorkshire Quarter Sessions. In 1833, a butcher was indicted for allowing offal and dung to lie near a public road,[8] and the other nuisance indictments were all related to parishes failing to keep roads and bridges in good repair, except one for keeping a fierce dog. By the mid-1830s, indictments for corruption of the atmosphere had disappeared altogether,[9] and by the end of that decade the Quarter Sessions as a whole had decreased notably in size and scope. The only indictments classified as nuisances were road and bridge presentments.

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[4] West Yorkshire Archives Service, QS4/38, Leeds Sessions, 5th October 1775. For quotations from this case, see Chapter One, note 40.
[5] West Yorkshire Archives Service, QS4/41, Sheffield Sessions 13th October 1784.
[6] West Yorkshire Archives Service, QS4/42, Pontefract Sessions 20th April 1789.
[7] See Chapter Two, notes 20 and 23.

In Lancashire, a similar process of decline can be seen at approximately the same time. Many newly industrialized areas lacked borough status, and thus had no town government. In such places, the Quarter Sessions were often the primary venue for a wide variety of judicial and administrative matters. This was the case in Lancashire, where even Manchester lacked borough status until 1839.[10] Other older towns, such as Liverpool, had long-established borough governments, but overall the county Quarter Sessions remained very important until the mid-1830s. Consequently, when municipal reforms were introduced in the same decade, a key mechanism for controlling industrial pollution was lost.

In Lancashire, pollution indictments can be found throughout the 1820s, with a cluster of atmospheric pollution indictments between 1819 and 1822, similar to those found in West Yorkshire. These included several iron founders indicted for smoke pollution,[11] along with several other nuisances described in Chapter One. Notable later indictments included inappropriate disposal of "manure dung and night-soil", so that "noisome offensive and unwholesome smells, stinks and vapours" were produced.[12] In the early 1830s, some large industrialists were convicted of producing smoke pollution. James Muspratt, a successful Liverpool chemical manufacturer, was indicted in 1830. Several charges were made against him, beginning with the allegation that in order to manufacture "victriolic acid" (sulphuric acid), he

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[8] West Yorkshire Archives Service, QS4/64, Leeds Sessions, 16th October 1833.

[9] Nuisance indictments from 1835 and 1836 concerned almost exclusive road and bridge presentments, with one notable exception in the case of an innkeeper who diverted the "medicinal waters" from public springs, "for his own private gain and lucre and further intending to damage pollute and otherwise affect and injure the said public wells and springs". West Yorkshire Archives Service, QS4/65, Knarlesborough Sessions, 18 October 1836.

[10] Until 1839, the city of Manchester remained a part of Salford hundred, and justice was administered for the city quarterly through the county Court of Quarter Sessions.

> … did unlawfully and injuriously make set up and place and cause and procure to be made set up and placed in the said erection and building divers Stoves Furnaces Retorts Cauldrons Six Boilers Six Cisterns and six Reservoirs for the purpose of burning calcining boiling and elaborating sulphur salt and other Chemical ingredients…[13]

These furnaces produced large amounts of smoke pollution. The jury further charged that Muspratt produced more atmospheric pollution through his chemical manufacturing processes. They declared that he,

> unlawfully and injuriously did compound mix together fuse melt and evaporate divers powerful and noxious Chemical ingredients to the Jurors unknown and did … cause divers noxious unwholesome suffocating and deliterious vapours gases effluvia volatile matters smokes smells and stenches to be emitted and issued …[14]

In 1831 and 1832, two more Lancashire "manufacturing chemists" were indicted for very similar offences.[15]

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[11] Lancashire R. O., QJI/1/193, Salford hundred, Easter Sessions 1819; Amounderness, Leyland and Blackburn hundred, October Sessions 1821.

[12] Lancashire R. O., QJI/1/200, Kirkdale and Salford hundreds, July Sessions 1826.

[13] Lancashire R. O., QJI/1/204, Kirkdale hundred, October Sessions 1830.

[14] Ibid. This case was taken to appeal by Muspratt, which he eventually lost in 1838. See *The Queen v. Muspratt* (Liverpool, 1838).

[15] Lancashire R. O., QJI/1/205, Kirkdale hundred, January Sessions 1831. This case is interesting because a warrant was issued for the offender, Thomas Lutwyche. See also Lancashire R. O., QJI/1/206, Kirkdale hundred, January Sessions 1832.

Following these actions, however, the Quarter Sessions shrunk dramatically in size. A decade later, several Lancashire towns began to be incorporated as boroughs. Between the 1840s and 1860s, the new borough councils gradually established committees to enforce environmental standards, but these took time to become operational. In Burnley, for instance, a sanitary committee was established in 1850,[16] and Blackburn created a sanitary and slaughter houses committee in 1857.[17] While significant local improvement undoubtedly resulted from these municipal reforms, local residents appear to have been left with little recourse to traditional local legal remedies for many years in several of Lancashire's industrial towns.

Similarly, in Leicestershire the changes brought by the *Municipal Corporations Act* of 1835 meant that a significant amount of time was needed for the new municipal government to take root and to branch out into areas such as pollution control. In addition, it is interesting to compare industrial areas with more agricultural counties. In places where polluting factories did not figure prominently until later in the nineteenth century, such as Leicestershire, a variety of issues of an environmental nature were nonetheless adjudicated at the Quarter Sessions.

Prior to the changes of the mid-1830s in local government, various offences touching upon resource use and environmental concerns were brought before the Leicestershire Quarter Sessions. These included pound breach (unathorized entry into a pound to remove an animal that had been impounded by a local official) and illegal grazing,[18] poaching,[19] obstruction of public highways with such nuisances as pig sties,[20] and even the illegal milking of a cow.[21] Although there were no industrial smoke pollution indictments, the Quarter Sessions were a venue in which many issues with environmental implications were addressed.

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[16] Lancashire R. O., CBBu 12/1/1, Sanitary Committee Minutes 1850-1856.
[17] Lancashire R. O., CBBN/1/16/1, Sanitary and Slaughter Houses Committee minutes 1850-1857.

By the 1830s, however, the range of items recorded in the Quarter Sessions records were much more restricted and standardised. Soon after, in December 1835, a new Leicester town council and aldermen were elected according to the new requirements of the *Municipal Corporations Act*.[22] In early 1836, an enquiry was undertaken to determine what public offices existed in Leicester, and which should be abolished. Because the Act empowered them to establish "an efficient Police" and other public services, they sought to abolish enough offices and public festivities to save £1000 annually. They thus abolished such offices as the mole catcher, and appointed several new committees, including one "for the prevention of nuisances and the good government of the town".[23] This committee does not appear to have become very active, however, as no reports from it are included in the town's records.

Not until the 1848 *Public Health Act* was adopted in Leicester was significant action taken to improve Leicester's environment. In September 1848, a

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[18] Leicestershire R. O., County Records, Sessions Rolls, QS3/352/1, Midsummer (Translation) Sessions 1802 (now on microfilm, MF 506).

[19] Leicestershire R. O., County Records, Sessions Rolls, QS3/417-421 [1818-1819], 24 October 1818 (now on microfilm, MF 515). See also QS3/462, 23 Dec. 1823 (MF 520).

[20] Leicestershire R. O., County Records, Sessions Rolls, QS3/421 Epiphany Sessions (8 January) 1821 (now on microfilm, MF 517).

[21] The indictment was for illegal entry into a "Cow house" to milk a cow. Leicestershire R. O., County Records, Sessions Rolls, QS3/462, 13 January 1824 (now on microfilm, MF 520).

[22] Leicestershire R. O., Minutes of the Council or Common Hall, CM1/1, meeting of 31 December 1835, pp. 1-3.

[23] Leicestershire R. O., Minutes of the Council or Common Hall, CM1/1, meeting of 13 January 1836, pp. 20-21, 26, 39, 40; meeting of 20 January 1836, p. 47.

Sanitary Committee was appointed. Under its purview, police officers were ordered to perform inspections on a weekly basis, and to bring to the attention of the Committee any nuisances. The nuisances included "offensive privies and cesspools", derelict houses, the inappropriate keeping of swine, and pollution of drains, inappropriate disposal of dung, offal and other animal by-products, and one for the noxious trade of bone-boiling.[24] If offenders failed to act when presented with a notice to remove their nuisances, they were fined 10s. per day.

Further measures were taken at the beginning of the 1850s with the appointment of an Officer of Health for Leicester. The Officer's annual reports described the public health improvements accruing in Leicester, and offensive industries were listed in the first such report, published in 1851. The report noted, "[t]he great attention paid by the Board to the prevention of the establishment of offensive trades in improper situations", and expressed confidence that this improvement would "give to Leicester an arrest of the evils from which we have so long suffered."[25]

Overall, the traditional practice of securing indictments of polluters at Quarter Sessions declined by the mid-nineteenth century in all the counties studied. It was gradually replaced by committees convened under the new town councils created in the wake of the municipal reforms of the 1830s. Although changing local circumstances had varying consequences for different localities, in all of the places under study the 1830s and 1840s saw extended periods of adjustment in the wake of far-reaching municipal reforms. Therefore, as the role of the Courts of Quarter Sessions was restricted, it became increasingly difficult for local authorities and individual community members seeking to pursue action against industrial polluters through the established pre-industrial means of local indictments, since the venue in which indictments were delivered was experiencing such large-scale change.

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[24] Leicestershire R. O., Sanitary Committee minutes, CM2/1, meetings of 26 September 1848 to 13 April 1849, pp. 1-18.

[25] J. Buck (Officer of Health), *Report on the Sanitary Condition of Leicester in 1851* (Leicester, 1851), Leicester Corporation Health Reports, MF150/3, p. 10.

The 1821 Smoke Prohibition Act: problems encountered

The provisions of the 1821 *Smoke Prohibition Act*, despite their innovation and initial success, also encountered difficulties as industrialization progressed. In particular, the *Act* left much interpretation and power of mitigation to judges and juries, who were in a position, if so minded, to undermine the spirit of the Act. Some evidence of such action can be found alongside the evidence revealing the success of the Act in encouraging legal action.

As discussed in Chapter Two,[26] the 1821 *Smoke Abatement Act* encouraged common law actions against owners of polluting steam engines and furnaces, and gave judges the power to order alterations to be made to such industrial equipment if they considered that these would prevent further nuisances. Therefore, the Act did not introduce a statutory smoke prohibition, but did confer upon judges new powers to take action against polluters. However, the decision to use those powers rested with the judges presiding over nuisance cases; the Act did not require the use of the new powers.

In 1824, a case tried in York, *Rex v Gott*, revealed the extent to which judges were able to manipulate the provisions of the Act in order to circumvent the desired goals of the legislation. At the trial, the prosecutors proved that a nuisance had been created by the defendant, but before the jury was left to adjudicate, the judge intervened to direct the jury. He "so repeatedly reminded the parties that the Act left him to use his own discretion, and so plainly intimated that that discretion would not be exercised in their favour, that they consented to a verdict of not guilty." As the smoke abatement expert, Charles Wye Williams, explained when discussing the case, "The decision of the court, in fact, neutralized the operation of the Act."[27] *Rex v Gott* contrasts markedly with the numerous prosecutions undertaken in the early 1820s following the passage of the 1821 Act and described in Chapter Two.

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[26] See Chapter Two, notes 20 and 23.

As England's industrial base grew, and interests began increasingly to clash, the possibility did arise for wilful ineffectuality with respect to enforcement of the smoke law. Several aspects of such failure can be ascertained from case law as well as commentaries by contemporaries. In 1829, for example, the author of a letter to *The Times* bemoaned the industrial smoke pollution plaguing Brighton. As he explained, the smoke stemmed from the establishment of coal-powered bathing facilities and increased as the numbers of visitors to Brighton grew, with the effect that "[t]he asthmatic and the consumptive sufferer, deluded with vain hopes of a pure air from the sea, is compelled to inhale the unwholesome, and to him fatal, effluvia of a series of coal furnaces."[28] The author argued that it was easy to prevent smoke pollution, by either "burning" the smoke or using coke as an alternative fuel source, and pointed out that although there were legal means available for fighting the smoke pollution problem, local authorities were not fighting the smoke nuisance effectively:

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[27] C. W. Williams, *Prize Essay on the Prevention of the Smoke Nuisance* (London, 1857), p. 44.
[28] *The Times*, 23 October, 1829, p. 3, col. D.

> If the "Fire Kings" of Birmingham will not adopt either of these means of themselves, the public have the means of compelling them: 1st. By indictment. An act was passed seven or eight years ago to compel the use of "smoke consumers" in furnaces where the smoke from them was a nuisance to their neighbours. The commissioners of the town would do well to enforce this salutary law.[29]

A case from 1832 reveals further problems concerning the enforcement of the 1821 Act. It was noted in Chapter Two that an important feature of the Act was the power it gave to award legal costs to those willing to commence nuisance prosecutions. In *The King v. Joseph Moate*, the types of legal costs awarded to a successful prosecutor were significantly curtailed. The defendant, the owner of a soap factory, requested a special jury to hear his case and agreed that if he lost, he would pay all costs.[30] An arbitrator found in the favour of the prosecutors (the local authorities) and ordered the defendant to pay all costs. The Court of King's Bench overruled the arbitrator, however, and the defendant was relieved of the costs of convening the special jury. Despite the dissent of the Attorney General,[31] the Court's decision likely served to impede nuisance prosecutions as it demonstrated that those willing to undertake such action against industrial polluters could not definitely expect to recover the costs they incurred.

When considered together, the problems that gradually emerged surrounding the 1821 Act and its interpretation and enforcement likely fostered concern among those interested in reducing industrial smoke pollution as to the

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[29] Ibid.

[30] *The King v. Joseph Moate* [1832], *The Law Journal*, vol. 1 (New Series), p. 78.

[31] The Attorney General argued against the decision, pointing out that the defendant had requested the special jury in the first place and should, therefore, pay for it. *The King v. Joseph Moate*, p. 79.

Act's adequacy. As industrialization grew in scale and scope, it is likely that people involved in the smoke debate foresaw further problems with this Act that was created in an earlier phase of industrial and economic development.

Local improvement Acts

As the established means for fighting industrial smoke pollution slowly became more cumbersome and less effective, local authorities resorted with increasing frequency to local improvement Acts. Like the 1821 *Smoke Prohibition Act*, the numerous examples of such laws enacted in the first half of the nineteenth century receive little attention from historians. Brian Clapp mentions only one such Act, while he and several other historians provide no discussion of them or the relationship between them and later initiatives at the national level.[32] Once again, the interpretations offered of them are largely negative.[33] They are characterized as too weak in terms of the fines imposed, and unfair in their applicability because they were only local in scope, thus polluters could easily move to another nearby location. In addition, the problem of local authorities being polluters themselves was a continual danger.[34]

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[32] Several historians view the national legislation of this period in terms of central attempts to force compulsory action. While this was an important theme in these decades, the result has been that local influence on national legislators and legislation is often overlooked. For example, see F. B. Smith, *The People's Health 1830-1910* (New York, 1979), p. 199-203.

[33] Peter Brimblecombe, for instance, lists several impediments to the smooth functioning of the local improvement Acts and concludes that, "It is true that extraordinary difficulties faced the implementation of the early legislation with the result that the Improvement Acts had, in general, been a dismal failure. Although there were successes, they were few and far between." P. Brimblecombe, *The Big Smoke* (London and New York, 1987), p. 97.

[34] The longest discussion of all these problems is provided by Anthony Wohl in his *Endangered Lives: Public Health in Victorian Britain* (London, 1983), pp. 220-224.

The local improvement Acts were, in fact, important for several reasons. They were adopted by local authorities frustrated by their lack of power with respect to pollution problems, and they long predate the 1842 *Leeds Improvement Act*, the most famous local Act often cited by environmental historians. In addition, it was in these Acts that the inspiration for the smoke pollution legislation of the mid-nineteenth century can be found.

Local improvement Acts were Acts passed in Parliament that applied only to particular designated localities. They commonly concerned such issues as town improvement, water provision, gas lighting, and sewerage. The earliest such laws predated the 1821 *Smoke Prohibition Act*. In the 1820 Select Committee report on smoke pollution, Manchester merchant Thomas Fleming mentioned that he served as a commissioner empowered to investigate nuisances under the *Manchester Police Act* and to order people or firms found guilty of smoke pollution to adopt technologies to burn up and eradicate their smoke.[35] Following the Manchester law, other local Acts containing smoke abatement provisions included an Act for providing Huddersfield, West Yorkshire, with water, the *Derby Improvement Act*, and finally the *Leeds Improvement Act* in 1842.[36] Like the *Manchester Police Act*, these imposed requirements on owners of steam engines to use equipment that burnt the smoke produced by the fires fuelling the engines as fully as possible.

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[35] Report from the Select Committee on Steam Engines and Furnaces: &c. 5 July 1820. *BSP* 1820, II, pp. 250-251.

[36] All three acts are listed in the appendices of the 1846 Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, pp. 337-338. The *Derby Improvement Act* referred to is most likely the Act of 6 George IV (1825), c. 132. See http://www.opsi.gov.uk/chron-tables/local/chron016.htm (10 Aug. 2005).

The *Huddersfield Water Act* and the *Derby* and *Leeds Improvement Acts* contain very similar clauses. The earliest, the *Derby Improvement* Act of 1825, provided in section 65 that,

> … all furnaces employed or to be employed in the working of engines by steam, and all furnaces employed or to be employed in any mill, factory, brewery, bake-house, gas-works, or other buildings used for the purposes of trade or manufacture within the said borough (although a steam-engine be not used or employed therein) shall be constructed in the best manner known or practised so as to consume their own smoke …[37]

Section 249 of the *Leeds Improvement Act* is almost identical, requiring that,

> … all furnaces employed or to be employed in the working of Engines by Steam, and all Furnaces employed or to be employed in any Mill, Factory, Dye-house, Brewery, Bakehouse, Gas Works, and other Buildings used for the Purposes of Trade or Manufacture within the said Borough (although a Steam Engine be not used or employed therein), shall, in all Cases where the same shall be practicable, be constructed so as to prevent or consume their own Smoke…[38]

Offenders under both acts were to be fined up to 40 shillings per week during which the smoke pollution occurred. *The Huddersfield Water Act* of 1827 differed slightly, particularly in terms of its length and detail, in requiring, "that the furnace of every steam-engine, if any, to be erected by the said Commissioners, shall be constructed upon the principle of consuming or regulating its own smoke, provided that the same can be satisfactorily effected by any apparatus now known for that purpose."[39]

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[37] 6 Geo. IV (1825), c. 132, s. 65. cited in Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 337.
[38] *Leeds Improvement Act, Local and Personal Acts*, 5 & 6 Vict. (1842), c. 104, s. 249.
[39] 7 & 8 Geo. IV (1827), c. 84, s. 33. Cited in Report addressed to Viscount Canning, &c., p. 338.

The key feature of these laws, and what distinguishes them from the 1821 *Smoke Prohibition Act* and the *Manchester Police Act*, is the fact that their primary goal was to counter smoke pollution through the use of specific statutory prohibition. The goals of the *Smoke Prohibition Act* were, first, to encourage members of the public to seek indictments of industrial polluters for public nuisance, and secondly, once an indictment was secured, to enable justices to require offenders to adopt technologies for more cleanly burning coal. The *Manchester Police Act* had similar goals, and under it justices were again only empowered to act once an offender had been prosecuted. By contrast, the main premise of the Derby, Leeds, and Huddersfield Acts was a general prohibition of industrial smoke pollution. The emission of excess coal smoke became a statutory nuisance, and the relevant local authorities were now required to act in a summary way upon receiving information concerning a smoke nuisance. Fines were to be imposed as laid out in the Act rather than by deciding on a case-by-case basis what punishment, if any, should be imposed on offenders (as would occur in civil litigation or in the case of an indictment before magistrates).

This is an important change in the legislative philosophy concerning smoke pollution. Statutory smoke nuisance law is widely considered by historians to have emerged by the mid-nineteenth century with the enactment of a number of anti-pollution clauses, among them the 1848 and 1875 *Public Health Acts*, 1853 *Metropolitan Smoke Abatement Act*, and several *Nuisance Removal Acts*. However, these statutes, which are commonly viewed as landmarks, were in fact preceded by several smoke consumption clauses written into local improvement Acts between the 1820s and 1840s. It was these local Acts, not the national statutes of later decades, that first articulated the statutory smoke prohibition and informed the legislative efforts of the central government for several decades thereafter.

The smoke clauses in all of these Acts were new in the sense that they made excessive industrial smoke emission a statutory nuisance, so that smoke pollution became a generally prohibited act. This meant that statutory nuisance provisions applied to anyone regardless of circumstances, and therefore did not involve the judicial interpretation so vital to common law proceedings. In the statutory law, the offence of smoke emission was clearly described in a statute, and it was to be dealt with summarily, meaning that if an offence was committed, one justice of the peace alone could impose fines. The fines were also laid out in the statutes. Therefore, there was, theoretically, no need for lengthy and expensive trials except in the case of appeals.

As we have seen, common law nuisance was relational in nature, and the definition of smoke pollution as nuisance at common law required that an offender's smoke emissions be proved to be harmful to the property of others or to the health of the wider community. Juries and judges were required to decide when a reasonable usage of industrial premises became an unreasonable, actionable nuisance.

In the local smoke consumption clauses, however, this notion of relativity and the requirement to establish suffering in order to deem an activity a nuisance had almost disappeared from discussions of smoke pollution law. In the statutory provisions, in order to secure a nuisance conviction, it was no longer required that the damage caused by smoke pollution be demonstrated or proven. The only requirement was to prove that smoke had been emitted in excessive amounts. Legislators appear to have accepted the harmful effects of smoke emissions as given, and focused instead on the commission of the offence of creating smoke pollution regardless of its effects in each particular instance of pollution emission.

Local improvement Acts and the "best practicable means" clause

An important aspect of the local improvement Acts of the early nineteenth century was that in them the "best practical means" clause first made its appearance in statutory form. The clause was included in the smoke prohibition provisions of many such laws over the first half of the nineteenth century. It stipulated that owners of industrial furnaces were required to use the best practicable means known to be available to avoid emitting excessive amounts of smoke.

This aspect of the local improvement Acts is the feature most closely examined by historians. The latter tend to view the "best practicable means" standard in a largely negative light, characterizing it as, at best, an unworkable test, or, alternatively, as a provision deliberately designed to provide an easy loophole for polluters. This is similar to their view of the 1821 *Smoke Prohibition Act*, in the sense that their negative assessment of the clause appears to stem from examination of the issue from the vantage point of the later nineteenth century and in its current relevance in present-day pollution law.

This clause has a much longer and more intricate history than that commonly described, however, a fact that has important implications for assessing the motivations of those pursuing environmental legislation in the nineteenth century. In its earliest statutory forms, the "best practicable means" clause was in fact designed to place a burden on defendants not only to utilise the most modern and effective means available to combat the industrial pollution they produced, but also to prove that they had done so. Secondly, it was in the early years of anti-smoke pollution legislation, when smoke abatement was considered to be easily and economically achievable, that the "best practicable means" clause was introduced, and the relative lack of scientific knowledge regarding smoke pollution helped rather than hindered the drive for smoke abatement legislation. This was because at a time when effective smoke abatement was considered a simple matter and easily achievable, legislators were willing to impose stricter requirements on polluters. Only in later decades, when the smoke abatement legislation became increasingly complicated as the possibility of wholly controlling industrial smoke became more remote and industries began to request exemptions from statutory provisions, did the "best practicable means" clause assume the role of a viable defence for, rather than a requirement of, polluters.

Several historians offer different points of origin of the "best practicable means" test in smoke prohibition laws. They almost all, however, interpret the clause as an unworkable provision that allowed polluters to avoid convictions easily. Meetham et al. claim that the *Alkali Act*, 1863, "introduced the now accepted concept of 'best practicable means'".[40] Alternatively, Brian Clapp argues that it was the 1842 *Leeds Improvement Act* that first "gave birth to the famous formula" of

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[40] A. R. Meetham, D. W. Bottom, S. Cayton, A. Henderson-Sellers, D. Chambers, *Atmospheric Pollution: Its History, Origins and Prevention*, 4th ed., (Oxford, 1981), pp. 207-208.

"best practicable means". Clapp asserts that once this formula was created, it made prosecution under the smoke abatement law very difficult. He considers the "best practicable means" test to have constituted an easy defence for industrial polluters from its inception because, as he explains, "[w]hen the science of smoke abatement had scarcely been established, the formula provided ample scope for a successful defence against prosecution."[41] Eric Ashby and Mary Anderson present a similarly pessimistic view of the clause found in the *Leeds Improvement Act*. They point out that the penalties imposed for polluting were "trivial", and that "the owner of the furnace was well protected against anyone optimistic enough to bring suit against him. How do you define 'in the best manner known or practised'? How, indeed, do you define smoke? And what are the 'best practicable means'?"[42]

Peter Brimblecombe's assessment of the "best practicable means" most clearly reflects present-day concerns regarding the ambiguity of the clause. He explains his view in his discussion of the 1853 *Metropolitan Smoke Abatement Act*.

> One important amendment was the introduction of the phrase 'best practicable means' to the wording of the law. This concept has now become embedded in British environmental legislation. Like 'common sense' and 'good practice' these terms have remained part of the flexibility of a system which has been notoriously reluctant to fix quantitative limits to the permissible levels of pollution. The idea was simply that the best practical means available to prevent smoke should be applied.[43]

It is true that the "best practicable means" clause does figure prominently in current environmental law in a manner that fosters ambiguity concerning pollution limits. The clause plays an important role in two key pieces of British environmental legislation: the *Environmental Protection Act*, 1990,[44] and the *Clean Air Act*, 1993.[45] It is included in the sections in both acts that concern statutory nuisances or indictable offences. In each law, a number of such offences are outlined along with the actions to be taken by the relevant authorities when the offences are committed. The laws then stipulate that in some cases, defendants may cite, as a valid defence, the fact that they had used the best practicable means available to avoid committing the offence, despite the fact that these means were not sufficient to stop the emission of pollution. In this way, industrialists can be protected from prosecution in certain cases where there are no known existing means enabling them to avoid polluting the environment. Both the definition of "best practicable means" and its criteria of applicability are detailed and contain ambiguities that appear to have led to debate with respect to the scope and merits of this clause.[46]

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[41] B. W. Clapp, *Environmental History of Britain* (London, 1994), p. 32.
[42] E. Ashby and M. Anderson, *The Politics of Clean Air* (Oxford, 1981), p. 7.
[43] P. Brimblecombe, *The Big Smoke: A History of Air Pollution in London since Medieval Times* (London and New York, 1987), p. 103.

The goals and usage of the "best practicable means" clause were different in the early nineteenth century, however, and changed only gradually over the course of the nineteenth century. It is therefore a mistake to judge the earliest usage of this clause in terms of its future form and merits. Although today it is applied to a wide variety of environmental rules, its first statutory use was in smoke abatement clauses in the 1820s. The form it took in these early years can be found in the *Leeds Improvement Act*, 1842, which Clapp mistakenly cites as its point of origin. This Act contained a clause stating that a forty-shilling fine per week would be imposed,

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[44] *Environmental Protection Act*, 1990 (c. 43), part III, ss. 80(7), 79(9). Available online at http://www.hmso.gov.uk/acts/acts1990/Ukpga_19900043_en_4.htm#mdiv79 (accessed 1 June 2005).

[45] *Clean Air Act*, 1993 (c. 11), part I, s. 4. Available online at http://www.hmso.gov.uk/acts/acts1993/Ukpga_19930011_en_1.htm (accessed 1 June 2005).

[46] To see how complicated the "best practicable means" clauses in current British environmental law are, see R. Butterfield and J. Holroyd, *Statutory Nuisance: A Guide for Professionals* (Sudbury, Suffolk, 2000), pp. 54-56; R. McCracken, G. Jones, J. Pereira and S. Payne, *Statutory Nuisance* (London, 2001). David VanderZwagg mentions the confusion caused by the inclusion of "best practicable means" clauses in international environmental law. He points out that while Article 192 of the United Nations Convention on the Law of the Sea (UNCLOS) asserts that, "states have the obligation to protect and preserve the marine environment", Article 194 then "leaves considerable national discretion in standard-setting through the malleable language like 'using … best practicable means at their disposal and in according with their capabilities." Talk given at the 1997 joint Maritime Institute of Malaysia (Mima) and South-East Asia Programme in Ocean Law, Policy and Management forum, quoted in "Saving the Abused Sea" by Alam Sekitar, *The Star* (Malaysia), 3 June 1997, available online at *http://agrolink.moa.my/moal/newspaper/alamsekitar/re970603.html* (accessed 1 June 2005).

> if any Person shall … use any Furnace for any of the Purposes aforesaid within the said Borough which shall not be so constructed as aforesaid, or shall negligently use any Furnace for any of the Purposes aforesaid so constructed as to prevent or consume the Smoke thereof, or shall carry on any Trade or Business which shall occasion any noxious or offensive Effluvia, or otherwise annoy the Neighbourhood or Inhabitants, without using the best practicable Means for preventing or counteracting such Annoyance …[47]

This wording is quite different from that found in the present-day "best practicable means" clauses contained in the *Environmental Protection Act*, 1990, and the *Clean Air Act*, 1993. In 1842, the onus was clearly on the defendant to adopt the best known means available to curb industrial smoke emissions. Usage of the "best practicable means" was not explicitly characterised as a defence available to polluters; rather, it was one of the requirements the law demanded of them. *The Derby Improvement Act*, 1825, was even more explicit in this regard. It required that industrial steam engines and furnaces, "shall be constructed in the best manner known or practised so as to consume their own smoke".[48] It then contained an almost identical provision to the Leeds act, imposing a forty-shilling fine for anyone violating the requirements of the act, including failure to use "the best means then known for preventing or counteracting such annoyance." The Derby Act, which predated the Leeds Act by eighteen years, clearly intended the "best practicable means" clause to be a burden placed on the defendant both to use the most effective means in existence to curb smoke emissions and to prove that he or she had used them. The *Huddersfield Water Act*, 1827, is more equivocal in this regard, but once again the phrase resembling the "best practicable means" is not explicitly laid out as an available defence. Rather, it required that, "the furnace of every steam-engine, if any, to be erected by the said Commissioners, shall be constructed upon the principle of consuming or regulating its own smoke, provided that the same can be satisfactorily effected by any apparatus now known for that purpose."[49]

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[47] *Leeds Improvement Act*, *Local and Personal Acts*, 5 & 6 Vict. (1842), c. 104, s. 249.

[48] *Derby Improvement Act*, 6 Geo. IV(1825), c. 132, s. 65. Cited in Report, addressed to Viscount Canning, &c. by Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 337.

These earlier instances of the use of the "best practicable means" clause shows that the clause was not something new to either 1842 or 1863. This is important because it brings into question Clapp's argument that the first articulation of the clause in 1842 inaugurated a period of ineffective legislation that contained an easy defence for industrial polluters to fall back on in "best practicable means". It also raises questions concerning the negative historiographical teleology that sees the development of environmental law in the nineteenth century as doomed to failure from its inception due to the rise of economic liberalism, industrial capitalism, and consequent unwillingness on the part of legislators to restrict industry through statutory means. If the "best practicable means" clause was included in statutes dating to the earliest decades of the nineteenth century, the *Leeds Improvement Act* could not have marked the beginning of a new period in

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[49] 7 & 8 Geo. 4 (1827), c. 84, s. 33. Cited in Report addressed to Viscount Canning, &c., p. 338.

British environmental law. In addition, if the emergence of a virtually unenforceable body of anti-pollution law was not a new, mid-nineteenth-century innovation, one must be careful not to link this development in an excessively deterministic manner to the rise of laissez-faire economic policy favouring industry over individual property rights and the environment.

On the other hand, the discovery that the origins of the "best practicable means" clause lay a few decades earlier than Clapp and Meetham et al. argue might not have been very important if the clause had in fact originated in statutory form. However, it did not, and its true origins appear to lie in civil litigation involving nuisances. In June 1819, a month prior to the first committee report on smoke abatement, the member of Parliament who chaired the committee, Michael Angelo Taylor, put forward a motion in the House of Commons to convene a select committee. In laying out his reasons for such a committee, Taylor mentioned that,

> All lawyers considered the evil which he was now desirous of remedying as a nuisance, and an indictable offence; and in a late trial before Mr. Justice Bayley, the Court had held it to be incumbent on the defendant to show, that he had used all the means in his power to prevent the nuisance complained of.[50]

An appeal of a public nuisance indictment recorded in the *English Reports* in 1832 reveals that the notion of the "best practicable means" played an important role in nuisance proceedings at common law. In *Rex v Pease*, a railway company was indicted for having built a railway line too close to a public highway, and for operating steam locomotives on the line which burned "divers large quantities of coke, coal, charcoal, wood, &c., close to the said part of the said highway, and thereby corrupted the air and caused noisome smokes, &c…"[51] The company had received statutory permission to build the line, but the question arose of whether the permission was granted "only with some implied condition or qualification, that they should employ all practicable means to protect the public against any injury from them?"[52] It was decided that the statutory provisions did not require that the best practicable means be employed. Nonetheless, the judges argued that a nuisance at common law could not be deemed to have been created because "[t]he company have exercised their power so as to cause the least possible inconvenience, by using engines of the best construction."[53] Thus, usage of the best practicable means was an established requirement of alleged polluters in nuisance cases, and was still taken into account in nuisance actions even when statutory permission had been granted for particular industrial activities.

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[50] Hansard, *Parliamentary Debates*, 1st ser., XL, 8 June 1819, col. 976.

Equally important is the fact that one cannot examine the "best practicable means" test without recognising that in its statutory form, it was always included as part of a larger smoke abatement provision which began with a prohibition of smoke emissions from steam engines and furnaces. This means that from its first introduction in statutory nuisance law, the "best practicable means" clause was always an integral aspect of far-reaching, ambitious smoke abatement provisions, which themselves were new to the early nineteenth century. It was not a negative clause added onto long-established anti-smoke provisions in order to curtail their scope. Thus it was by no means intended to make enforcement difficult or impossible, as Clapp implies, although this did eventually happen. As discussed above, the smoke abatement clauses in the Derby and Leeds Acts are almost identical. Subsequent local acts also incorporated very similar clauses, an example being the *Salford Improvement Act* of 1844.[54] The key point they all had in common was that they contained a clause generally prohibiting the emission of injurious industrial smoke (with a few industries exempted). Aside from this prohibition, these acts were much the same as the many other local improvement acts passed in the early and mid-nineteenth century. They were all largely devoted to environmental improvement, contained rules concerning the proper keeping and cleansing of privies, drains, cesspools and sewers, fire prevention, regulation of slaughterhouses, safe building techniques, disposal of refuse, and gave powers to magistrates to order cleansing and repairs to unfit houses, derelict and noxious buildings and premises. Some local acts even enacted different provisions regarding smoke emissions, but these were limited in scope. For instance, an 1842 Liverpool Act ordered that "if any Person shall permit any Smoke or Steam to be discharged from the Front, Side, or End of any Building into any Street, every Person so offending shall forfeit a Sum not exceeding Five Pounds."[55]

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[51] *Rex v. Pease* [1832], 110 *English Reports*, p. 367.
[52] *Rex v. Pease* [1832], 110 *English Reports*, p. 371.
[53] *Rex v. Pease* [1832], 110 *English Reports*, p. 370.

When seen in this light, the "best practicable means" clause enshrined in the *Leeds Improvement Act* appears to have been part of the aspect of the act that distinguished it from other local improvement acts due to its more progressive environmental stance. Although other local acts contained many positive and pro-active environmental regulations, these regulations were well established in legislation and were not geared specifically toward the problems faced by an industrial society. In contrast, the "best practicable means" clause was an element in smoke prohibition provisions which went further than any other local acts in terms of attacking industrial pollution. The local Acts containing smoke abatement clauses were not passed at a time when the established pattern in local improvement Acts was to contain stricter anti-smoke pollution clauses, so that the insertion of a "best practicable means" clause did not compromise strict existing rules concerning smoke emission. Therefore, this proliferation of the "best practicable means" clause in various local improvement Acts does not appear to initially have had deliberately negative environmental implications, and as such is not analogous to the concurrent developments in case law, in which the ancient and strict common law property rights defined in the doctrine of *sic utere tuo* are said to have been relaxed and compromised in the nineteenth century by judges who sought to protect polluting industries and thus adopted a "balance of equities" approach that weighed the benefits of the existence of industry against the injury caused to individuals rather than strictly enforcing the common law property rights.

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[54] *Salford Improvement Act*, 7 & 8 Vict. (1844), c. 33.

[55] *An Act for the Promotion of the Health of the Inhabitants of the Borough of Liverpool, and the better Regulation of Buildings in the said Borough*. 18th June 1842. *Local and Personal Acts*, 5 & 6 Vict. (1842), s. 65, p. 1147.

With respect to the point that "best practicable means" clauses must be seen in the context of smoke prohibition clauses, it is important to note that in 1821 the *Smoke Prohibition Act* did not include any reference to a clause resembling "best practicable means". This is most likely because the 1821 Act did not deem industrial smoke emission a statutory nuisance. It encouraged indictment of polluters for public nuisance, a common law process incorporating significant judicial discretion. Justices were empowered to order that offenders adopt cleaner technologies that would curb their industrial pollution in the long term, but the decision to do so was theirs and was to be based upon an assessment of each case individually. This was in keeping with nuisance under the common law, which was always defined in terms of the relationship between the activities of one person and the effects of those activities on other people. In 1860, Baron Bramwell (a judge in the Exchequer court) succinctly described this relativity as being the rule of "give and take, live and let live".[56] This meant that significant judicial interpretation or discretion was required in the determination of common law nuisance cases in order to decide whether the offensive activities were injurious to others.

By contrast, in the Acts that contained provisions deeming smoke pollution a statutory nuisance, local authorities were required to act if the criteria comprising a statutory nuisance laid out in the statutes were met. This process no longer demanded the same consideration of the facts surrounding each case, in particular of the extent of the effects of the offender's activities on others. Given the ancientness of the common law, however, it made sense that in the earliest enactments of statutory nuisances legislators would seek to retain a level of judicial discretion. A clause such as "best practicable means" achieved this goal by giving the authorities power to mitigate the fines and punishments imposed on polluters.

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[56] Quoted from *Banford v Turnley*, cited in R. McCracken, G. Jones, J. Pereira, S. Payne, eds. *Statutory Nuisance* (London: 2001), p. 3. William Blackstone's description of nuisance with respect to offensive trades also reflects the relativity inherent in common law nuisance. He wrote that it was an "injurious nusance" if someone's neighbour "sets up and exercises any offensive trade; as a tanner's, a tallow-chandler's, or the like; for though these are lawful and necessary trades, yet they should be exercised in remote places; for the rule is, '*sic utere tuo, ut alienum non laedas:*' this therefore is an actionable nusance." J. Chitty, ed., *Commentaries on the Laws of England: By the late Sir W. Blackstone* (London, 1826 edition), III, p. 217 (citing from Cro. Car. 510). McCracken et al. define this relationship between parties as "reciprocity" and point out that one cannot be found guilty of nuisance if the injurious effects of one's activities are only felt by oneself. McCracken et al., *Statutory Nuisance*, p. 3.

Therefore, because the *Smoke Prohibition Act*, 1821, did not contain a statutory smoke prohibition, there was no need for the discretionary power contained in a "best practicable means" provision. However, with the new legislative philosophy enshrined in subsequent legislation, beginning with the Derby, Huddersfield, and Leeds acts, the mitigating "best practicable means" clause most likely became necessary in order for the legislation to be accepted. As the new legislative philosophy took hold, the clause then became entrenched, appearing in statutes from the 1853 *Metropolitan Smoke Abatement Act* through the 1848 and 1875 *Public Health Acts* and the *Alkali Act*, 1863, and throughout environmental law up to and including existing legislation.[57]

The wording of the *Huddersfield Water Act* points to a final important issue concerning the historical development of the "best practicable means" clause. Throughout the period 1819-1875, those in favour of anti-smoke legislation made it clear that while they felt most industrial smoke could be eradicated easily and economically, they did not feel that all smoke emissions from all industrial processes could always be stopped. Numerous witnesses before the various committees who favoured smoke abatement law in general pointed out that they were aware of some industrial processes that would not likely prove easily adaptable to smoke abatement techniques and equipment.[58] Most smoke abatement clauses contained exemptions for certain industries. In this context, the insertion of a "best practicable means" clause was logical in that it kept the smoke abatement provisions from being entirely invalidated if it emerged that a particular industry or industrial process was unable to be adapted to meet the requirements of the clauses. In this light, the "best practicable means" clause can be seen as a way to make the acts operable, rather than as a way to ensure their inoperability, as Clapp suggests.

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[57] In addition, McEldowney and McEldowney point out that despite the attempts of William Blackstone and Jeremy Bentham to codify the common law and create a set of abstract, rational principles upon which it could be based, the common law instead remained highly empirical, with "strict procedural rules" through which judges could investigate the individual facts of each case. The concept of judicial discretion was thus very deeply entrenched in the common law, which makes it likely that it did in fact influence early statutory nuisance law.

[58] For example, George Muntz, a member of the 1843 Select Committee and a "master manufacturer" from Birmingham who claimed to have pursued smoke abatement techniques and equipment for thirty-five years, warned that iron works, glass works, and other industrial processes

Lastly, the attitude of later legislators toward the "best practicable means" clause is revealing. As time elapsed, several problems in the wording of the statutory smoke provisions in the local improvement Acts came to light. Rather than allowing the clause to become a loophole of sorts for polluters, however, legislators repeatedly attempted to resolve these problems and to render the "best practicable means" clause more proactive and forceful.

Peter Brimblecombe mentions that in 1846, a report concerning smoke abatement written for Parliament by two scientists, Sir Henry Thomas de la Beche and Dr. Lyon Playfair, mentioned that the local improvement Acts had proven "quite unworkable" for several reasons.[59] Among the reasons cited was the fact that the weak wording of the "best practicable means" clauses in the local Acts had led to people interpreting them to mean that "the complainant is obliged to prove the practicability of consuming the smoke, proof of which may be impossible in the

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requiring extreme heat would not prove able to adopt such technologies. Report from the Select Committee on Smoke Prevention. 17 August 1843. *BSP* 1843, VII, p. 391.

[59] Brimblecombe, *The Big Smoke: A History of Air Pollution in London since Medieval Times*, p. 102.

present state of the law, when even officers authorized by Government cannot enter and inspect premises, if objected to by the owners."[60]

However, de la Beche and Playfair then called for the preservation of the "best practicable means" clause in a more robust form. The authors recommended more strongly worded smoke abatement clauses in which the burden of proof should be explicitly placed on the offender, "who ought to show that he has adopted the best known means for preventing the nuisance, or, in absence of such proof, incur the penalty."[61] This reveals that they were aware that there had been a more proactive goal when the "best practicable means" clause was initially included in smoke prohibition provisions, which had become obscured with time. The authors' call for its retention, moreover, suggests that they still viewed the clause as a potentially meaningful feature of smoke law.

A similar treatment of the "best practicable means" clause was offered in 1862 before the Select Committee on Noxious Vapours (which drafted the 1863 *Alkali Act*). The Committee recommended consolidating and rendering universally applicable the various existing laws concerning the emission of smoke and other industrial vapours and "effluvia". This would involve giving inspectors free access to industrial premises, and restricting appeals of convictions for smoke pollution to higher courts "to cases in which the magistrate should certify that they involved question of law fitting to be there heard and decided." Once that was achieved, they felt that it would be possible to return to a system in which, "the magistrates may be safely entrusted with the discretionary power involved in the terms, 'the best practicable means for counteracting the annoyance'."[62] These recommendations indicate that the committee members sought to make the "best practicable means" part of a strict body of law that removed the possibility of easy avoidance by polluters. Thus, while the clause had indeed become problematic by mid-century, and, when viewed from the vantage point of the 1860s and later, the negative interpretation it prompted from the historians noted above seems reasonable, this negative interpretation cannot justifiably be extended to the earlier statutory usage and original purpose of the clause.

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[60] Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 335.

[61] Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 335.

Local improvement Acts: inspiration for activity at the national level

Local improvement Acts also inspired national action, a final point largely neglected by historians. The first parliamentary investigation into the possibility of a new national smoke abatement Act began in 1843, just one year after the passage of the *Leeds Improvement Act*. The members of the Select Committee convened in 1843 were heavily influenced by the activities of local authorities, in particular the creation of local improvement Acts. These local Acts thus grew to have implications on a national scale, and several aspects of their smoke prohibition clauses were incorporated into national legislation for decades to come.

In 1842, a public meeting on the smoke problem was held in Leeds. At the meeting, models of smoke abatement technologies were displayed by the patentees who had invented them, and a committee of sixty men was appointed to investigate the possibilities for smoke abatement. The meeting concluded with a confident resolution that, "in the opinion of this meeting the smoke arising from steam-engine fires and furnaces can be consumed, and that, too, in many cases, without injury to the boilers, and with a saving of fuel".[63] The meeting was chaired by William Beckett, a Member of Parliament for Leeds.[64]

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[62] Report from the Select Committee of the House of Lords, on Injury from Noxious Vapours, 1 August 1862. *BSP* 1862, XIV, pp. 8-9.

In 1843, when the House of Commons convened a Select Committee to investigate the same topic, William Beckett was the first witness to appear before it. He explained that smoke pollution in Leeds was so bad "that it induced a number of gentlemen to associate themselves together for the purpose of discovering the best mode of diminishing that nuisance." They interviewed as many scientists and manufacturers as possible, and this led to the passage of the improvement act. Beckett argued that the industrial smoke nuisance had been significantly reduced since the passage of the Act, although the only proof he had were observations by himself and other inhabitants of Leeds, and that, as far as he was aware, polluters had voluntarily sought to adopt cleaner technologies so that no prosecutions had yet been necessary.[65]

In the early 1840s, therefore, the central legislators interested in creating a new smoke abatement Act were provided with a statutory model developed at the local level and embodied in numerous local improvement Acts. Furthermore, the creators of these local Acts provided positive commentary on them in 1843, when central initiatives first became officially organised through the Select Committee on Smoke Prevention. Thus, while the local improvement Acts may ultimately have proven largely unworkable, they were perceived in a positive light at the time of their enactment, and that confidence spread to the national arena through the connections between central government and localities made by people such as William Beckett.

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[63] Quoted in C. W. Williams, *Prize Essay on the Prevention of the Smoke* Nuisance (London, 1857), p. 9.
[64] Ibid.
[65] Report from the Select Committee on Smoke Prevention. 17 August 1843. *BSP* (1843), VII. pp. 387-389.

Conclusion

This chapter has revealed the far-reaching changes in local administration that affected industrial pollution control in the first half of the nineteenth century. As municipal reforms were introduced in the 1830s, the scope of the authority of the Courts of Quarter Sessions, a crucial traditional mechanism through which common law rules were mobilized to fight the industrial smoke problem in the early nineteenth century, became increasingly limited. New town councils gradually instituted municipal committees to deal with various environmental problems, but the switch from one enforcement regime to the other left many localities effectively without authority to take action against polluters at a crucial period in England's industrial revolution history. In addition, the growth of the country's industrial base in both scale and scope posed potential difficulties with respect to the implementation of the 1821 *Smoke Prohibition Act*.

Both the changing local contexts between the 1820s and 1840s, and the connections between local and central initiatives are important historiographically. It is necessary to examine events at the local level in order to understand the new approach taken in the 1840s at the national level. Furthermore, the process of change explored in this chapter helps to explain why historians who begin their story in the mid- to late nineteenth century take such a negative view of the earlier attempts to control industrial pollution described in Chapters One and Two. Common law actions and the 1821 *Smoke Prohibition Act* were not inadequate from their inception; rather, they grew increasingly unworkable as local circumstances changed in the ways outlined in this chapter. Thus, the changing local contexts of the 1820s to 1840s reinforce the argument of this thesis that the initiatives of the early nineteenth century comprised proactive responses to rapidly changing circumstances. At the same time, they help explain the very different historiographical interpretation put forward by many historians.

This chapter has also cast a more positive light on the local improvement Acts passed in the first half of the nineteenth century. They contained the first statutory smoke prohibitions, constituting an important break from established common law doctrine, and can be seen as an attempt to introduce a stricter, more objective and impartial pollution control mechanism. The local Acts also introduced the "best practicable means" clause into smoke pollution law. This standard was not initially doomed to ineffectuality, either wilfully or through legislative ineptitude. Finally, local improvement Acts proved highly influential to national legislators in the 1840s in their quest to create a new national smoke abatement Act.

Overall, this chapter reveals the importance of investigating the interconnections between local and central governments. Interaction between these two spheres served to propel the smoke debate forward in the first half of the nineteenth century. This helps explain the declining success of common law nuisance actions in fighting industrial pollution and the growing use of statutory smoke prohibitions enacted in local improvement Acts. These aspects of the smoke debate remain obscure if attention is devoted solely to either central legislation or common law nuisance actions.

Chapter 4. The Drive for a New National Smoke Law, 1843-1853

Introduction

In August 1843, Henry Houldsworth, a well known industrialist, testified before a Select Committee of the House of Commons inquiring into the possibility of enacting legislation to curb industrial smoke pollution. Houldsworth expressed his support for such legislation, but added that despite his support,

> I have looked forward to legislative interference in this matter, and have seen the great difficulty of legislating, unless we have some means of defining what should constitute smoke in a Parliamentary sense ...[1]

What did Houldsworth mean by "smoke in a Parliamentary sense"? Industrial smoke was such an established fact of life in so many English cities and towns by this time that the question of its existence was surely beyond dispute. The nature and effects of smoke pollution were likely painfully clear to the inhabitants of those cities and towns. Moreover, in the early 1840s there was a *Smoke Prohibition Act* on the statute books, from 1821.[2] Why, then, the need to define "smoke"?

The problem posed by the legal definition of industrial smoke arose at this time because the legal means through which industrial smoke was controlled were undergoing a profound transformation. In the years between the passage of the *Smoke Prohibition Act* of 1821 and Houldsworth's testimony in 1843, legislators had attempted to move away from common law nuisance procedures, which had been the predominant means for controlling pollution for centuries, and instead now sought to enact statutory provisions to prohibit excessive industrial smoke emissions.

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[1] Report from the Select Committee on Smoke Prevention. 17 August 1843. *BSP* 1843. VII, p. 483.

[2] *An Act for giving greater Facility in the Prosecution and Abatement of Nuisances arising from Furnaces used and in the working of Steam Engines.* 1 & 2 Geo. IV (1821), c. 41.

Many historians and legal scholars argue that statutory nuisance law emerged in the nineteenth century in order to simplify the common law provisions relating to smoke pollution and their enforcement. Yet the question arises, was there a simple, unproblematic progression from a system centred on common law nuisance suits and indictments to a national statutory smoke abatement law? Were the changes brought on by the enactment of this law largely procedural, so that the conceptions of pollution and pollution control within each legal approach remained essentially the same?

While at first glance it appears that there was just such a progression, this chapter will argue that on closer examination it becomes clear that, rather, important changes of attitude and approach toward the nature and control of industrial pollution took place over this period, and these changes were articulated in the proposed smoke abatement legislation of the 1840s. Several sources of influence contributed to the drive for new legislation. To begin with, the legislators of the 1840s sought to replace the 1821 *Smoke Prohibition Act* with a substantively different smoke pollution law. In doing so, they adopted a variant of the smoke provisions articulated in the local improvement Acts discussed in Chapter Three, and sought to extend the concept of a statutory smoke prohibition to a national Act. Drawing on the model provided in such local Acts, their objective was to enact a strict, impartial smoke law that would provide extensive relief from the negative environmental effects of heavy coal-burning industrial activity..

Secondly, the emergence of a new conception of legislation as a mechanism through which it was believed positive social change could be effected contributed to the quest for a definitive national anti-smoke law. As compulsory national legislation grew increasingly popular, legislators eschewed the remedies provided through common law actions or the 1821 *Smoke Prohibition Act* and pursued a new national smoke law that would render the creation of smoke pollution a universally and summarily punishable offence.

These developments were aided by the fact that public support for the creation of robust smoke pollution law remained strong throughout the 1840s and early 1850s. As more people became involved in the smoke debate, the conception of smoke pollution took on new meaning that no longer fit easily with traditional common law nuisance doctrine. In particular, the rise of the public health movement helped raise the profile of the smoke problem beyond the local level as public health advocates took up the cause of curbing industrial pollution.

The numerous changes that resulted from this transformation, as a whole, struck at the very nature of pollution and its control since the new statutory regime contained a differing understanding of what constituted smoke pollution and how it might best be controlled. Therefore, not only were the legal remedies mobilised to deal with industrial pollution changing, from local indictments and enforcement of community standards by community members to a more centralised system of pollution control stemming from national law, but the predominant understanding of smoke pollution and of what it meant to abate smoke were also undergoing transformation.

Legislation 1843-1853

Two decades after the passage of the *Smoke Prohibition Act* of 1821, a Select Committee of the House of Commons was convened in 1843 to investigate the problem of industrial smoke pollution. There then began a series of legislative attempts that lasted ten years, culminating in the passage of the *Metropolitan Smoke Abatement Act* in 1853. These attempts were centred around a new approach to smoke law, highly influenced by the smoke provisions contained in numerous local improvement Acts by this time, yet seeking to extend such provisions to the national level.

The Committee was chaired by William Mackinnon, a Tory member of Parliament. Like Michael Angelo Taylor in 1821, William Mackinnon was an active and relatively independent member of Parliament who often opposed Tory policies. He was keenly interested in several public health initiatives in the mid-nineteenth century, foremost among them the reform of urban burial practices and the fight against smoke pollution problem.[3] It was due to his perseverance that the matter was brought to national attention in 1843 and remained there throughout the 1840s.

The 1843 Select Committee on Smoke Prevention interviewed many witnesses, including industrialists, scientists, and politicians. The overall tone of the testimony before the Committee was highly confident with respect to the merits of new smoke law, with even the strong advocate of mechanization, Andrew Ure, favouring smoke abatement legislation.[4] Moreover, the Committee's report presented to Parliament was very much in keeping with this optimism. It began with the three main questions that the committee had set out to resolve: whether it was "practicable" to eradicate, or at least significantly diminish, smoke pollution in populous areas; if it did turn out to be possible, then was it desirable to seek to do so, "as so doing might interfere with the property or interests of manufacturers, or of the proprietors of furnaces"; and lastly, what legislation they might propose should smoke abatement be proven possible and desirable.[5]

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[3] H. C. G. Matthew, 'Mackinnon, William Alexander, of Mackinnon (1784-1870)', *Oxford Dictionary of National Biography*, Oxford University Press, 2004. Available online at: http://www.oxforddnb.com.login.ezproxy.library.ualberta.ca/view/article/17619 (accessed 9 August 2005).

In response to these questions, the committee members first concluded that, "it appears from the whole of the evidence of scientific and practical men, including master manufacturers, that Smoke, which is the result of imperfect combustion, may in all cases be much diminished, if not entirely prevented."[6] They explained that the incomplete combustion of the coal fuel used to feed the fires occurred because these were enclosed fires in furnaces, and the lack of air to which they were exposed led to significant amounts of the coal not being properly oxidized and instead being emitted in an unburned, sooty form directly into the atmosphere. Furthermore, they pointed out that if means were found to burn all of the coal more fully, the fires would require less fuel to burn for the same amount of time at the same temperature. They therefore argued that the cost of purchasing and installing one of the various smoke abatement technologies available at the time would be more than offset by the resultant savings.[7] The only type of engine listed for which the savings in fuel might not so clearly exceed the costs of altering it to burn more cleanly was the kind used in steam powered boats.

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[4] Report from the Select Committee on Smoke Prevention, 17 August 1843. *BSP* 1843, VII, p. 401.
[5] Ibid., p. 381.
[6] Ibid.

After determining that significant reductions in smoke pollution were indeed possible, the committee reached its final conclusion, that legislation requiring the owners of steam engines and furnaces to reduce their pollution through the use of any of the existing smoke abatement mechanisms should be enacted. They justified their decision by explaining that,

> … seeing that the evils arising from Smoke are severely felt in all populous places, and are likely to increase in proportion as wealth and the use of machinery cause a greater extension of furnaces and steam-engines, [the committee] come, without hesitation, to the conclusion, that such a Legislative Enactment should be introduced without delay; and they trust that the perusal of this Evidence will ensure cordial aid and co-operation, on the part of the proprietors of factories, in accomplishing an object so essential to the comfort and well-being of the surrounding country and population, –an expectation which Your Committee feel justified in entertaining by the knowledge of the laudable exertions which have lately been made, with much success, by the manufacturers and inhabitants of Leeds and Bradford in Yorkshire, for the prevention of Smoke in those districts.[8]

The Committee thus felt that the public suffering caused by smoke emissions, combined with the ease with which they believed such pollution could be avoided, provided justification for anti-pollution legislation. As the above paragraph reveals, their optimism extended beyond their belief in the possibility of abating smoke pollution. They described their confidence that, in addition, industrialists would willingly comply with the requirements of the proposed legislation, most likely in large part due to the fuel they could expect to save by installing smoke abatement equipment. Not only was excess industrial smoke deemed avoidable, but it appeared to the committee that those responsible for the smoke would prove equally interested in changing their practices in order to improve the environmental conditions in cities and towns.

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[7] Ibid., pp. 381-382.
[8] Ibid., p. 382.

Proposed legislation was tabled in the House of Commons in the following year. A bill "to prohibit the Nuisance of Smoke from Furnaces or Manufactories" was first introduced in May 1844, and then reintroduced a month later with revisions. The bill was the first piece of proposed national legislation to include a general smoke prohibition clause with fines ranging from five to twenty pounds, although its provisions only applied to certain hours of the day. Emission limits were set according to the number of chimneys found on each industrial premises:

> ....it shall not be lawful for the occupier of any Furnace or Chimney to permit opaque Smoke to issue from such Chimney between the hours of Six of the clock in the morning and Seven of the clock in the evening for any longer period than is hereinafter mentioned; (that is to say) from any Chimney from which is emitted the Smoke of one Furnace only for a longer period in the whole than Twelve Minutes in any Three consecutive Hours; and from any Chimney from which is emitted the Smoke of Two Furnaces for a longer period in the whole than Twenty-four Minutes in any Three consecutive Hours; and from any Chimney from which is emitted the Smoke of Three Furnaces for a longer period in the whole than Thirty-three Minutes in any Three consecutive Hours; and from any Chimney from which is emitted the Smoke of Four Furnaces for a longer period in the whole than Forty-two Minutes in any Three consecutive Hours; and from any Chimney from which is emitted the Smoke of Five or more Furnaces for a longer period in the whole than Forty-eight Minutes in any Three consecutive Hours.[9]

The preamble, in outlining the purpose for the bill's introduction, emphasised both the wasting of fuel resulting from bad use of furnaces and the injury to health caused by smoke pollution, and asserted that "the same can be remedied by proper care and attention …" To help encourage industrialists to abide by the bill, it called for the appointment of "inspectors of smoke nuisances" who would be empowered to take action against polluters (instead of the existing system under which justices could only indict offenders upon information brought from the public). Once action was taken against an offender, he or she would first be served with an abatement notice ordering the cessation of smoke pollution to the extent outlined in the bill. If the polluter failed to act upon the abatement notice, fines would automatically be imposed. At the same time, the bill included a clause exempting collieries, mines and metal works from prosecution and another allowing for the mitigation, or reduction, of penalties by justices if they, "considering all the circumstances of the case, think it right so to do."[10] This combination of provisions, while they perhaps appear contradictory at first glance, clearly reflected the goals laid out in the preamble while also accommodating the legislators' concerns that certain industries would be unable to immediately abide by a general smoke prohibition given the contemporary state of smoke abatement technology.

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[9] A Bill to prohibit the Nuisance of Smoke from Furnaces or Manufactories. 12 June 1844. *BSP* 1844, IV, pp. 558-559.

The 1844 bill failed, and a revised version was introduced in the House of Commons in March 1845. It was much the same as the 1844 bill, with a few changes. Rather than including a long list of limits on smoke emissions calculated chimney by chimney, this bill simply restricted the time during which smoke could be emitted to fifteen minutes per day, which was stated to be enough time to light the fires fuelling industrial furnaces. The inspectors called for in the 1844 bill would be authorized to enter any industrial premises to determine the cause of the "opaque smoke". Fines were reduced from between five and twenty pounds to between twenty and forty shillings, which was very close to the level of fines for smoke emissions contained in the earlier local improvement Acts. Finally, a schedule that outlined the form of proceeding was attached to the bill. The wording of the schedule appears to have come directly from the local improvement Acts with the additional inclusion of steam boats. It required that,

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[10] Ibid., p. 561.

> … every furnace employed or to be employed in the working of engines by steam, and every furnace employed or to be employed in any mill or factory used for the purpose of manufacture (although a steam-engine be not used or employed therein), or the furnace of any steam-boat, shall, in all cases where the same shall be practicable, be constructed so as to consume or burn the smoke arising from such furnace; and if any person shall, after the said first day of January next, use any such furnace, which shall not be so constructed as to consume or burn its own smoke, or shall so negligently use any furnace constructed to consume or burn its own smoke as that the smoke arising therefrom shall not be effectually consumed or burnt, or shall otherwise annoy the neighbourhood or inhabitants, without using the best practicable means for preventing or counteracting such annoyance, every person so offending shall forfeit and pay the sum of Forty Shillings for and in respect of every week during which such furnace or annoyance shall be used and continued, after Fourteen days' notice shall have been given to him by the Council to remedy or discontinue the same…[11]

This bill was thus very similar to that of 1844, with some refinements that simplified the smoke prohibition provision and gave greater powers to the proposed inspectors of smoke nuisances. The progress of the bill was stopped, however, when another smoke Committee was convened in April 1845. Its report, issued in May 1845, still advocated a universal smoke abatement Act, but called for caution in some areas. Most importantly, it recommended only making the Act applicable to stationary steam engines (as opposed to those used in boats or trains), since it was revealed in the minutes of evidence that the application of smoke abatement technology to steam boats would be significantly more difficult and expensive. The Committee's cautious wording is also reflected in the first point listed in the report: "That Opaque Smoke issuing from Steam-engine Chimnies may be so abated as no longer to be a Public Nuisance."[12] This wording differed notably from the confident assertion made in the 1843 Committee report that, "Smoke, which is the result of imperfect combustion, may in all cases be much diminished, if not entirely prevented."[13] It is equally striking to compare the 1845 wording to the statement made by the chair of the 1820 smoke Committee, Michael Angelo Taylor. Taylor had travelled to Warwick to visit the premises of Josiah Parkes that were fitted with Parkes's own smoke abatement equipment, and his amazement at the success of Parkes's equipment can be seen in his testimony. He "could not perceive the least smoke arising from any chimney in the place" and upon examination of the adjoining garden was equally impressed to discover that not a single flower suffered from "the affection of soot or smoke", a source of particular concern to him since his own garden at Whitehall was continually destroyed by furnace smoke.[14]

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[11] A Bill To prohibit the Nuisance of Smoke from Furnaces or Manufactories. 5 March 1845. *BSP* 1845, VI, p. 44.

The growing caution revealed in the 1845 report was also manifested in the next smoke abatement bill, introduced in late May 1845. The title of the bill was changed from a bill "to prohibit the Nuisance of Smoke from Furnaces or Manufactories" to one "to abate the Nuisance of Smoke from certain Furnaces and Chimnies." The contents were largely the same as the March 1845 bill, but with some key changes. The most important was the smoke prohibition clause, which no longer contained any fixed time limitations imposed on smoke emissions, but instead simply stated that, "opaque Smoke shall not be permitted to issue from any Chimney of a Furnace for any longer period of time than is bonâ fide necessary for the kindling of the fire of such Furnace."[15] However, the fines were raised back to the original level of five pounds.

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[12] Report from the Select Committee on Smoke Prevention. 9 May 1845. *BSP* 1845, XIII, p. 541.
[13] Report from the Select Committee on Smoke Prevention. 17 August 1843. *BSP* 1843, VII, p. 381.
[14] Report from the Select Committee on Steam Engines and Furnaces &c. 5 July 1820. *BSP* 1820, II, p. 244.

Despite the weakening of the smoke prohibition in this bill, its introduction caused enough controversy that yet another committee was convened in July 1845, primarily to hear testimony from a number of industrialists. After hearing a somewhat shorter amount of testimony than was common in the earlier reports, from nineteen witnesses, the committee made one single recommendation, that, "it appears to Your Committee inexpedient, under existing circumstances, to apply the provisions of the proposed Bill to Furnaces connected with the manufacture of Iron, Copper, and Coal Works, and with Distilleries."[16] Testimony revealed that the legislators appeared to be unaware of numerous industrial processes that did not fit easily with the provisions of the bill. For instance, one witness argued that in iron works, smoke was not created when the fires were first lit, but rather when they were "replenished" later on, so that short periods of smoke creation were necessary throughout the day in iron works. Therefore, although the wording of the smoke prohibition clause had been repeatedly simplified, it was considered, by many industrialists, too rigid to be universally applicable. In the end, no smoke abatement legislation was enacted in 1845.

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[15] [new title] An Act to abate the Nuisance of Smoke from certain Furnaces and Chimnies. 21 May 1845. *BSP* 1845, VI, p. 48.

[16] Second Report from the Select Committee on Smoke Prevention. 11 July 1845. *BSP* 1845, XIII, p. 623.

At this point, Lord Lincoln, the Chief Commissioner of Woods from 1841 to 1846, became involved. His involvement was a significant development, and resulted from the withdrawal of the 1845 bills from before the Commons, a move agreed to by the advocates of the legislation in exchange for a promise by the government to investigate the matter and introduce a new, more universally applicable law. As Lord Lincoln explained, it was decided that, "a subject of such admitted public importance should be left in the hands of Her Majesty's Government, and that some general measure, having for its object the suppression of smoke in towns and populous districts, should be by them submitted to Parliament."[17] Lincoln broke from the established practice of interviewing men from many different industries who had experience with both smoke pollution and developments in smoke abatement technology. Instead, he appointed Thomas de la Beche, the director of the Museum of Economic Geology (in London), and Dr. Lyon Playfair, a chemist at the museum who had done some research on smoke abatement, to investigate the subject. Lincoln appeared to be suspicious of the appeals for exemption from the 1845 bills made by the numerous industrialists the year before when he requested that, "You will be so good as to direct your especial attention to iron-works, distilleries, potteries, sugar refineries, and other works which, in the last Session, claimed exemption from the Bill then before Parliament, and to ascertain whether these claims were well founded."[18] He also requested that de la Beche and Playfair look into the problems reported concerning the various local improvement Acts that contained smoke abatement clauses.

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[17] Letter of instructions from the Earl of Lincoln, 27 August 1845. Cited in Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 331.

This new approach to investigating the problem of smoke pollution produced some interesting results. To begin with, the two scientists supported the findings of the 1843 and 1845 Committees that, scientifically speaking, smoke abatement was practicable in most industrial contexts, and that it should result in greater fuel economy. However, they then pointed out that, "although this theoretical conclusion is undoubtedly correct, the practical results are not always consonant with this statement."[19] Their research revealed that the main reasons for the failure of smoke abatement equipment to create savings in fuel were the following:

> 1. The want of proper construction and adjustment between the fire-places and the boilers, and the disproportionate size of the latter to the amount of work which they are expected to perform.
> 2. The delicacy of draught, and improper construction of the flues leading to a chimney of inadequate height or capacity.
> 3. The carelessness of stoking and management by those entrusted with the charge of the fire-places and boilers.[20]

They also identified certain problems regarding the smoke clauses of the local improvement Acts that they felt could be improved upon. They pointed out that the awareness of these problems among those responsible for the local Acts, and the consequent caution exercised by them in drafting the legislation had led to the creation of local legislation that had become, "to a great extent inoperative, sometimes from the leniency of the measures, at other times from the expense attending their adoption, and in all cases from the manner in which the clauses have been drawn up."[21] Some of the people with whom they corresponded provided examples of clauses in the local legislation that had been well intended yet misguided. Thomas Harwood from Derby, for instance, explained that the stipulation in the *Derby Improvement Act* that the pollution had to occur for a week to be indictable was too long a period to be able to indict many polluters since smoke tended to only be emitted for much shorter periods, often with long intervals in between. He recommended removing all mention of time limitations.

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[18] Report, addressed to Viscount Canning, &c. &c. &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, pp. 331-332.
[19] Ibid, pp. 332-333.
[20] Ibid., p. 333.

In terms of wording, de la Beche and Playfair proposed strengthening the clauses regarding supervision of industrial premises by inspectors, making it more explicit that the onus was upon defendants to prove that they had attempted all means available to avoid emitting smoke pollution if they sought an acquittal on these grounds, and clearly differentiating between the steam engines and furnaces in glass works, iron works and pottery works (which should be subject to the law) and the particular industrial processes required in those industries that would not be amenable to smoke abatement technologies. They finished their report by stressing that while some industries would likely have to be exempted from any general legislation, they did feel that, "With regard to steam-engines, the processes for the prevention of smoke have been matured, and in very many instances successfully employed. In this case, therefore, a law to that effect could be most easily and promptly carried out."[22]

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[21] Ibid, p. 333.
[22] Ibid, p. 336.

In spite of the extensive recommendations of de la Beche and Playfair, it was not until 1848 that another smoke bill was introduced in Parliament, this time in the House of Lords, [23] and not until 1853 that a revised Act was passed. In the meantime, the central drive for compulsory statutory anti-smoke law took an interesting diversion. The 1848 smoke bill introduced in the House of Lords was withdrawn when a statutory smoke consumption clause was included in the *Health of Towns Bill*.[24] This bill eventually became the *Public Health Act* of 1848, but by the time it was passed, the smoke clause had been removed from it.[25] There followed much opposition by industrialists, but in the early 1850s two new influential people championed the proposed smoke law, Lord Palmerston, the Home Secretary in Lord Aberdeen's government in 1853, and Sir John Simon, Medical Officer of Health for London. In 1851, the *London Sewers Act* had been amended to include a smoke prohibition clause,[26] and Simon sought to have this statutory provision extended to apply to the entire metropolitan area. With their support, in 1853 the *Metropolitan Smoke Abatement Act* was passed. Thus, they finally achieved success, although of a more limited nature than William Mackinnon had envisaged.

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[23] A Bill, intituled, An Act to abate the Nuisance of Smoke from certain Furnaces and Chimneys (27 July 1848), *BSP* 1847-1848, VI, pp. 337-346.

[24] As William Mackinnon explained to the House of Commons in August 1848, "the Smoke Prohibition Bill was brought into that house three years ago; but, upon some objections being made by the noble lord then at the Woods and Forests, it was withdrawn after passing through committee. A noble lord in the other house, at the commencement of the present session, asked him whether he (Mr. Mackinnon) would let him bring in a bill in the House of Lords. A bill was accordingly brought in, and passed without any opposition. It then came down to the House of Commons, and was read a second time; but, in consequence of some suggestions (he believed from the Lords to the Government), the House of Lords had introduced into the Health of Towns Bill certain clauses relative to the prohibition of smoke, which made the continuance of the separate bill on that subject in the House of Commons unncecessary." *The Times*, 3 August , 1848, p. 2, col E.

[25] E. Ashby and M. Anderson, *The Politics of Clean Air* (Oxford, 1981), p. 31.

[26] *City of London Sewers Act, 1851*, 14 & 15 Vict. (1851), c. 91, s. 48.

The 1853 Act did, however, broaden the activities that constituted a statutory nuisance. Its smoke prohibition clause began with a long list of industries subject to the law including steamboats on the Thames above London Bridge. It further stipulated that negligent use of furnaces equipped with smoke abatement technology was an equally punishable offence, and then added that anyone who "shall carry on any Trade or Business which shall occasion any noxious or offensive Effluvia, or otherwise annoy the Neighbourhood or Inhabitants" would be guilty of a statutory offence. In addition, an amendment to the Act in 1856 extended its scope by adding the furnaces used in public baths and wash houses and increased the area on the Thames in which steam boats were required to use smoke abating equipment.[27] Overall, therefore, legislators appeared to have been interested in enacting meaningful anti-smoke pollution legislation, but did not succeed in developing an Act that was universally applicable on a national scale.

Continued and growing public support for a new smoke law

The legislative endeavours of this period were not produced as a result of a single influential or explanatory factor. Instead, a combination of factors helped shape the particular form assumed by these legislative attempts. This section will examine the first such factor, the fact that in the early 1840s, public support for a new smoke law remained high, as it had been in the early 1820s.

At the beginning of the 1840s, support for industrial smoke pollution control persisted with much the same optimistic tone as that was seen in 1819-1821 at the time of the creation of the 1821 *Smoke Prohibition Act*. By the 1840s, there was growing optimism, among an increasing and more varied group of people, with respect to the perceived technological feasibility of smoke elimination and the merits of seeking legislative means to ensure its elimination. This support continued throughout the decade leading up to the passage of the 1853 *Metropolitan Smoke Abatement Act*.

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[27] *An Act to amend the Smoke Nuisance Abatement (Metropolis) Act*, 1853. 19 & 20 Vict. (1856), c. 107.

To begin with, the confidence expressed by William Mackinnon and other Committee members and witnesses in the 1840s in the technical feasibility of eliminating industrial smoke pollution was shared by a growing number and variety of people in the same period. Numerous treatises on smoke abatement written by architects, engineers and other smoke experts discussed the ways in which smoke could effectively be prevented in industrial settings. In one such treatise, Robert Armstrong, a civil engineer, mentioned that extensive research and experimentation had been done on the smoke problem. He argued that most of the research had led only to failure, and he decried the amount of time and money wasted on ineffective solutions. He claimed that hundreds of patents had been taken out for such attempted solutions, at a cost of "hundreds of thousands of pounds".[28] Despite his criticisms, Armstrong's discussion reveals that the issue of smoke eradication was popular at this time and had seen large amounts of money and exertion applied it.

Evidence of the many smoke abatement inventions put forward in these years is abundant. Several advertisements for smoke abatement technologies appeared in *The Times*. In one such advertisement entitled, "Smoke Nuisance—Important to Engineers and Steam Engine Boiler Proprietors", a firm by the name of Dirks and

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[28] R. Armstrong, *An Essay on the Boilers of Steam Engines* (London, 1839), p. 27.

Co. extolled the virtues of Charles Wye Williams's patented smoke-free furnace, noting that, "[u]pwards of 400 patent argand smokeless furnaces have been erected in England and Scotland, and several may be seen in practical application in London."[29] Several other, much larger smoke abatement schemes were proposed in *The Builder*. The most elaborate of these called for the construction of a network of flues under public sidewalks, designed to carry the entire body of smoke produced by a town to the outskirts of the town to be consumed in several huge smoke stacks.[30]

The growing popularity of smoke abatement techniques and equipment did not escape the members of Parliament advocating the adoption of William Mackinnon's bill. In a House of Commons Debate on March 12, 1845, a supporter asserted that, "the principle of the Bill was universally approved of." He stressed that the public was aware of the ease with which industrial smoke pollution could be eliminated, but that assistance in the form of national legislation was required: "It was quite notorious that it might be got rid of, and it was in the power of Parliament to accomplish so desirable an object."[31] When a new Committee was convened in April 1845, *The Times* urged its members to introduce successful legislation. The editorial reminded readers of the large number of smoke abatement technologies discovered and written on by the Committee of 1843, and urged that,

> Owing to the immense increase in steam-engine chimneys within the last few years, the evil of smoke has reached a most intolerable height, and it is to be hoped that the committee this year will not expend their

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[29] *The Times*, 10 February, 1845, p. 11, col. C. Williams's "argand" furnace was built on the same principles as the popular argand lamp, which had a glass cover or shade on it that helped keep its flame smoke-free.

[30] *The Builder*, vol. 7, May 19, 1849, p. 233.

[31] Hansard, *Parliamentary Debates.*, LXXVIII, 12 March 1845, cols. 727-728.

> labour so uselessly as they did last year, but will devise some efficient plan for compelling the abatement of the nuisance, since no doubt now exists as to its practicability and the advantages to be derived from it.[32]

Disappointment in the lack of success of Mackinnon's bill was again expressed two months later, when Mackinnon agreed to let his bill be sent to a government Committee. As the editorialist succinctly put it, "Mr. Mackinnon's Smoke Prohibition Bill has ended in smoke".[33]

By the late 1840s, several factory owners publicly offered to display the workings of their smoke abatement equipment in order to raise awareness of the existing possibilities with respect to pollution prevention. Some factory-owners wrote to *The Times* offering to share the plans they had successfully used to reduce their smoke emissions. In July 1849, for instance, the owners of a rope-making factory in Wapping wrote that an engineer and bricklayer, working together, had "lately erected a steam-boiler and chimney on our premises, and at the trifling cost of a few shillings perfectly effected the very desirable object of Mr. Mackinnon's bill, to the great satisfaction of our neighbourhood generally."[34] They then offered to show their equipment to anyone who might be interested.

Such progressive industrialists were also increasingly recognised by people living near their premises. A letter from 1849 mentioned the brewery of Henry Meux, in central London, which had been successfully equipped with smoke abatement equipment. The author of the letter concluded that "I never walk along Oxford-street without thanking Sir Henry Meux and Co. in my heart for their regard for our lungs, and thinking how worthily their example might be followed by … hosts of other metropolitan manufacturers, whose public spirit might perhaps be roused if their attention were but called to the facility to which they might confer so great a benefit on their fellow citizens."[35]

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[32] *The Times*, 23 April, 1845, p. 4, col. F.
[33] *The Times*, 24 July, 1845, p. 5, col. D.
[34] *The Times*, 16 July, 1849, p. 8, col. F.

By the 1840s, interest in smoke pollution elimination extended beyond London. This was seen in Chapter Three, in which various local initiatives were discussed. These local endeavours were repeatedly raised by advocates of new smoke legislation and held up as models for national action. In March 1845, for instance, a member of Parliament objected to the smoke bill currently before the House of Commons. He argued that the findings of the 1843 Select Committee on Smoke Prevention "showed the extreme difficulty of legislation upon the subject." William Mackinnon was able to counter, however, with the argument that Leeds and Manchester, cities suffering from some of the worst industrial smoke pollution, had both successfully enacted smoke prohibition provisions.[36] Along similar lines, objections were raised publicly against the owner of a porcelain factory in Stoke-upon-Trent who had complained to Mackinnon that a smoke abatement requirement would force him out of business. The factory owner, who was also an alderman, claimed to have spent over £1200 attempting to equip his factory to prevent the emission of smoke pollution, and that this was simply impossible to accomplish in a porcelain works. This caused widespread reaction from various different people writing to *The Times*. The liveliest letter came from "A Soot-Hater", who ridiculed the arguments of the factory owner:

> I beg leave to ask the worthy Alderman whether it be or be not true, that within 100 yards of his porcelain manufactory an apparatus for

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[35] *The Times*, 17 July, 1849, p. 8, col. D.
[36] Hansard, *Parliamentary Debates*, LXXVIII, 12 March 1845, col. 728.

> preventing the emission of smoke has been applied, with the most complete success, to the porcelain manufactory of Mr. Minton; because, if such be the fact, the inference to be drawn from his statement is, not that the filthy and pestiferous nuisance cannot be abated, but only that the Alderman has for 20 years been making bungling experiments?[37]

The Times itself remained very much in favour of public health projects, including smoke abatement, throughout the 1840s and 1850s. Its writers continued to express the same sort of confidence regarding both the technical feasibility of smoke abatement and the fuel savings believed to result from it that can be seen among smoke law advocates since the early 1820s. In June, 1850, at the second reading of the latest smoke prohibition bill, an editorial commented on the necessity of such a measure. The author emphasised that it had long since been found possible to abate smoke without imposing an unreasonable financial burden on industrialists:

> The only question is, can the remedy be applied without inflicting injury on the interests of the proprietors of factories, breweries, &c. This is purely a matter of science and experience. There has, of course, been a very long and a very determined controversy upon the subject, but it would appear that the progress of modern science has at length triumphed over all difficulties, and enabled those who use a very simple apparatus to convert the foul smoke which issues from the tall chimneys of the manufactory into very useful and economical fuel.[38]

To sum up, this vocal public support for improved smoke pollution control, voiced within and outside of Parliament, helped bring the idea of a new smoke law to national prominence in 1843. As attempts to enact a new smoke abatement Act repeatedly failed, the persistence of favourable public opinion helped sustain the issue's popularity and the public's awareness of it.

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[37] *The Times*, 19 July, 1849, p. 5, col. B.
[38] *The Times*, 26 June, 1850, p. 6, col. D.

Conceptual shift borrowed from local improvement Acts

The growing support for a new smoke law was reflected in the proliferation of smoke prohibition clauses in local improvement Acts between the 1820s and 1840s. By the early 1840s, these local Acts proved influential to legislators seeking a national anti-smoke Act. William Mackinnon and other sympathetic legislators, in seeking an outright prohibition of the harmful emission of industrial smoke, sought a new kind of smoke law, one national in scope and comprising a stricter, more impartial form of pollution law. Despite their emphasis on creating a national law, a key source of inspiration for this new approach to smoke law stemmed from the initiatives undertaken at the local level—the incorporation of prohibitory smoke provisions in numerous local improvement Acts. Such clauses contained the first attempts to impose statutory smoke prohibitions, and provided a model for a new national smoke law. There were many commonalities between the central legislative activity of the period 1843-1853 and the smoke consumption clauses of the local improvement Acts. This interaction between local and central initiatives and historical actors is largely overlooked by historians.[39] Nonetheless, the interconnections between the two levels of government proved an influential factor shaping the smoke debate at mid-century.

The legislative attempts of this period are viewed by many historians and legal scholars as having developed naturally out of common law nuisance in order to meet the challenges of the new industrial society with all its environmental and public health problems. Statutory nuisances are seen to have differed from common law nuisances primarily in terms of the procedures involved for remedying them, rather than in terms of the activities that constituted a nuisance. Thus, both were considered much the same in terms of their substance. This historiographical interpretation implies that the local enforcement methods described in Chapter One, the 1821 *Smoke Prohibition Act* and later legislation shared identical conceptions of smoke pollution and its regulation and elimination. For example, Robert McCracken et al. argue that because of the ancientness of common law nuisance, civil actions and public prosecutions gradually became very complicated and costly to pursue. In response to these problems, the initial goal of statutory nuisance was to create generally applicable rules that would enable local authorities (magistrates, county courts, and so forth) to deal with such nuisances by themselves, easily and summarily.[40] David Hughes et al. add the point that by the mid-nineteenth century, the enormity of the public health problems facing legislators stemming from "the eruption of acre upon acre of filthy insanitary slums and factories" encouraged Parliament to enact statutory law to refine the existing system of pollution control.[41]

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[39] It is interesting to note that Asa Briggs points out that even as early as the 1840s, social critics "ignored the significance" of local improvement legislation. A. Briggs, *Victorian Cities* (Berkeley, 1993), p. 111.

This interpretation is convincing in several important ways. The complicated nature of common law nuisance and public health concerns were indeed matters of concern to legislators, as will be discussed below. However, such concerns contributed to the adoption, in the 1840s, of a new legislative approach that embodied a new understanding of industrial pollution, rather than merely a simplification or clarification of common law practices through statutory means. In this way, the legislation of this period was substantively very different from either common law nuisance or the earlier *Smoke Prohibition Act* of 1821. This point is noteworthy because the changes introduced with the new statutory smoke prohibition legislation contained the beginnings of a recognisably modern conception of the environment or the atmosphere as an entity distinct from the property and activities of humans. Moreover, by the 1870s, the distinct nature of this approach was lost as legislators ceased to seek a national smoke prohibition and instead reverted to a more conservative and reactive approach to the regulation of industrial smoke pollution, and, as a result, the smoke provisions included in the landmark statutes of the later nineteenth century lost much coherence.[42]

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[40] R. McCracken et al., *Statutory Nuisance* (London, 2001), pp. v, 1.
[41] D. Hughes et al., *Environmental Law*, 4th ed. (London, 2002), p. 3.

In Chapter Three, the smoke consumption clauses enshrined in the various local improvement Acts of the 1820s, 1830s, and 1840s were shown to have shed the relational quality that was crucial to the common law conception of nuisance. Instead, the emission of smoke pollution was declared an offence regardless of who or what might have been affected by it. The central legislative attempts of the 1840s and 1850s shared this important change with the local improvement Acts.

William Mackinnon addressed the House of Commons in July 1844 on the topic of the smoke abatement bill then before the House. In his address one can see this new definition of nuisance. He explained that in the previous session of Parliament, a committee had been convened "to investigate whether detriment arose to the health of the community from the increase of smoke in all large manufacturing places." This comment reveals that the committee was interested in forming a general opinion on the nature of smoke and its effects on public health that could apply automatically, without investigation, to all instances of industrial smoke pollution. The question of smoke pollution causing damage to the public's health and comfort could be considered axiomatic, rather than an issue requiring proof on a case by case basis. It was thus becoming an a priori assumption which justified the enactment of a national anti-smoke statute. In this way, such provisions could be exclusively centred on preventing the emission of smoke, and of rendering the creation of smoke pollution a generally prohibited and punishable offence.

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[42] Chapter Five will discuss this shift in more depth.

Throughout the various smoke abatement bills brought before Parliament between 1844 and the passage of the *Metropolitan Smoke Abatement Act* in 1853, the negative effects on the public of smoke pollution were mentioned only in the preambles of each bill, and as such were cited as the justification for the legislation but without requiring any demonstration of their existence. Furthermore, over this nine-year period, the preambles became progressively shorter, increasingly offering less information about the reasons for which the bill was drafted and about the harmful consequences of smoke pollution.

The preamble of the 1844 bill began with the words: "Whereas great loss of Fuel arises from the mismanagement of the Furnaces of Manufactories, and much injury to the health and comfort of the people is occasioned by the Smoke issuing from Furnaces, and the same can be remedied by proper care and attention …"[43] Although the loss of fuel and injury to public health were now considered well established consequences of smoke pollution, attention is still called to them in order to justify the subsequent smoke prohibition contained in the bill. The following year, an amended version of the same bill was reintroduced in the House of Commons, with a shorter opening sentence: "Whereas it is expedient to prevent the injury to the health and comfort of the people which is occasioned by the Smoke issuing from certain Furnaces and Chimnies …"[44] Finally, in July 1853, the preamble was devoid of any concrete justification for the enactment of the proposed legislation: "Whereas it is expedient to abate the Nuisance arising from the Smoke of Furnaces in the Metropolis and from Steam Vessels above London Bridge …"[45] This clause removed all explanation whatsoever, and instead merely deemed it "expedient" to abate smoke pollution. The same clause later formed the beginning of the preamble of the 1853 *Metropolitan Smoke Abatement Act.*[46] As focus shifted away from consideration of the effects of smoke pollution toward prohibition the emission of smoke outright, progressively less description of the negative consequences of industrial smoke became necessary.

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[43] A Bill [as amended by the committee] To prohibit the Nuisance of Smoke from Furnaces or Manufactories. *BSP* 1844, IV, 12 June 1844, p. 557.

In questioning the witnesses, the committee members at times moved beyond the simple fact of being personally annoyed by smoke and introduced broader, impersonal criteria such as harm to public health. This appears to have left some witnesses uncertain of the definition of a nuisance. For example, William Thomas Brande, a chemist, was a witness before the 1843 Committee and favoured anti-smoke pollution legislation. The Committee asked Brande if he had studied "the effect produced on the public health in consequence of the nuisance arising from smoke in large towns". In response, Brande revealed that he had suffered personally as a result of industrial smoke emissions, but he separated this personal suffering from questions of public health: "the nuisance everybody is acquainted with, and myself especially, residing among four steam-engines constantly; I feel very considerably annoyed by the quantity of smoke, but I am not prepared to say that my health suffers from it."[47] This unwillingness by Brande to equate being "very considerably annoyed" by smoke with the characterisation of smoke as harmful to public health suggests that in seeking to broaden the definition of smoke pollution to incorporate the public health angle which was of increasing concern, the Committee members undermined the older, familiar concept of nuisance.

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[44] A Bill [as amended by the Select Committee] To prohibit the Nuisance of Smoke from Furnaces or Manufactories. *BSP* 1845, VI, 21 May 1845, p. 47.

[45] A Bill to Abate the Nuisance arising from the Smoke of Furnaces in the Metropolis and from Steam Vessels between London Bridge and Richmond Bridge. *BSP* 1853, VI, 28 July 1853, p. 367.

[46] *An Act to abate the Nuisance arising from the Smoke of Furnaces in the Metropolis and from Steam Vessels above London Bridge.* 16 & 17 Vict. (1853), c. 128.

By changing the definition of a nuisance, the 1843 Select Committee was eroding the importance of the personal experience of smoke pollution. In this way, the understanding of what constituted smoke pollution was extending beyond the traditional concept embodied in nuisance law. This was an important departure from the common law emphasis on determining, in each individual case of smoke pollution, whether such pollution had caused sufficient damage to warrant an indictment for nuisance. In fact, its development precipitated a break from one of the most ancient and integral aspects of law for centuries, that of "sic utere tuo".[48]

Another important point in this regard was the fact that in moving toward statutory provisions, the Committee grew to focus on prohibiting the act of emitting industrial smoke, regardless of any possible mitigating circumstances, rather than seeking to prohibit the causing of harm to others through the emission of smoke, or seeking to impose a requirement to construct furnaces in a certain way, etc. This choice of approach to legislating smoke pollution control contributed to the growing rigidity of the definition of smoke pollution found in the statutory law as compared to that found in the common law.

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[47] Report from the Select Committee on Smoke Prevention, 17 August 1843, *BSP* 1843, VII, p. 573.
[48] See Chapter One for a full discussion of the "sic utere tuo" doctrine.

William Mackinnon explained that the idea for a general, statutory law involving summary convictions and fines came from the various local improvement Acts that contained smoke consumption clauses. However, the clauses contained in these local Acts were almost all identical in the sense that they required industrialists to build or adapt their furnaces in a way that would enable them to "consume" their own smoke.

The 1843 Committee did not recommend exactly the same sort of smoke abatement clause. Rather, it focused on the emission of smoke itself, rather than on its effects, and advocated legislation making smoke emission an offence. Mackinnon explained in Parliament, in July 1844, why the Committee had switched its focus in this way. They had been informed that the smoke clause in the *Leeds Improvement Act* contained a serious flaw: it required furnaces to be constructed in such a way as to consume their own smoke, and to enforce this, magistrates could authorise inspectors to enter industrial premises to inspect the construction of furnaces. This was very unpopular: "This power to enter premises was very obnoxious to the occupants of factories ..." Furthermore, the inspectors were often unqualified to perform such examinations. As a result, this clause in the Leeds Act "became a dead letter".[49]

Thus, the focus in the Leeds Act on the particular mode of construction of steam furnaces was deemed problematic. In response to the perceived problems found in the Leeds Act, Mackinnon pursued a slightly different wording. In drafting his bill, he explained that since he "had endeavoured to avoid the mistake in the Leeds Bill, he had thought it advisable, in the first place to define the nuisance of opaque smoke and then to fix a fine for the commission of the offence."[50] As he explained, the new focus on "the commission of the offence" (i.e. the emission of smoke) was deliberately adopted in response to the problems found to plague the *Leeds Improvement Act* and that had rendered that Act inoperable with respect to smoke pollution control. Thus the local legislation provided the initial inspiration for Mackinnon's decision to focus exclusively on the act of emitting smoke, and this change of wording further contributed to the departure from the common law conception of nuisance.

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[49] Hansard, *Parliamentary Debates*, LXXVI (1844), 3 July 1844, col. 284.

This shifting construction of the smoke provisions can be seen in a comparison of the wording of the Committee reports of 1819, 1820, and 1843. In the 1819 and 1820 Committee reports, the preamble read:

> The Select Committee appointed to inquire how far it may be practicable to compel Persons using Steam Engines and Furnaces in their different Works, to erect them in a manner less prejudicial to Public health and Public comfort...[51]

The 1843 Committee report began by laying out three questions that had guided its proceedings, the first question of which asked:

> Whether it was practicable entirely to prevent, or very much to diminish, the nuisance now so severely felt in large towns and populous districts from the Smoke of furnaces or of steam-engines.[52]

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[50] Ibid.

[51] Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. *BSP* 1819, VIII, p. 273.

[52] Report from the Select Committee on Smoke Prevention. 17 August 1843. *BSP* 1843, VII, p. 381.

To compare the two excerpts, in 1819 and 1820, the goal was to oblige individuals to adopt technologies that would lessen the negative effects on the public's health and comfort of the industrial smoke pollution emitted by furnaces and steam engines. In 1843, the goal was to prevent the smoke nuisance altogether in urban areas, or come as close to complete prevention as possible. This new approach focusing on the offence of emitting excessive smoke can be clearly seen in the title of the third clause of the June, 1844, Smoke Prohibition bill, entitled "Occupiers of Furnaces to prevent the issue of opaque Smoke":

> … it shall not be lawful for the occupier of any Furnace or Chimney to permit opaque Smoke to issue from such Chimney between the hours of Six of the clock in the morning and Seven of the clock in the evening for any longer period than is hereinafter mentioned…[53]

All of these clauses avoided any mention of consideration of the effects of the smoke emitted from the furnaces or chimneys. When viewed together, the subtle changes of attitude apparent throughout the 1843 Committee proceedings become apparent.

This changing conception of smoke pollution was initially obscured partly due to the fact that much of the older, common law terminology was retained in the 1843 Committee report, in particular the "nuisance from smoke" and its "abatement". Further reading and comparison of the Committee reports of 1819 and 1843 reveals this overlap of terminology. As noted above, both reports started with a question or questions that directed their enquiries. In response to the question of whether they could feasibly compel industrialists to adopt technologies less harmful to the public, the 1819 committee report offered the following recommendation:

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[53] A Bill [as amended by the committee] To prohibit the Nuisance of Smoke from Furnaces or Manufactories. *BSP* 1844, vol. IV, 12 June 1844, p. p. 557.

> … as far as they have hitherto proceeded, they confidently hope that the nuisance so universally and so justly complained of, may at least be considerably diminished, if not altogether removed.[54]

In response to their first question, that of the possibility of eradicating smoke pollution, the 1843 committee members wrote that,

> … it appears from the whole of the evidence of scientific and practical men, including master manufacturers, that smoke, which is the result of imperfect combustion, may in all cases be much diminished, if not entirely prevented.[55]

The key difference between these two excerpts lies in the fact that in 1819, the Committee contended that the "nuisance" caused by smoke pollution could be "considerably diminished, if not altogether removed". The 1843 Committee contended that "smoke" could be "much diminished, if not altogether prevented." This suggests that in 1819, when the Committee members included the term "nuisance", they meant a legal nuisance, as understood under the common law. They did not mean the complete eradication of smoke, but rather the lessening of the negative effects of smoke pollution to the point at which they would no longer be deemed a nuisance legally. In 1843, although the Committee members retained the word "nuisance" in the initial questions guiding their inquiry, in their recommendations they switch to using the word "smoke", so that they appeared to recommend that industrial smoke emissions be forcibly prevented. In contrast to the 1819 report, they no longer appear to have been referring to the legal concept of nuisance under the common law. This was a significant break from the past, a move away from understanding smoke pollution as a nuisance harming others, and one which implied a different nature and definition of smoke pollution. This change was articulated subtly at first, especially due to the retention of the established terminology of "nuisance" and nuisance "abatement" elsewhere in the 1843 report. Yet it was nonetheless an important shift, which opened the way for an attempt to create a national statute banning smoke emissions and offering a more rigid definition of smoke pollution than that under the common law.

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[54] Report from the Select Committee on Steam Engines and Furnaces &c. 12 July 1819. *BSP* 1819, VIII, p. 273.

[55] Report from the Select Committee on Smoke Prevention. 17 August 1843. *BSP* 1843, VII, p. 381.

The traditional emphasis on case by case decision making was a final noteworthy aspect of common law nuisance that was discarded by legislators in the 1840s. As explained in Chapter One, at common law, each nuisance required its own legal action, and the circumstances surrounding its creation had to be considered by a jury or judge. In the 1840s, however, the proposed smoke abatement bills presented before Parliament contained generally applicable definitions of what constituted unlawful smoke emissions. In addition, the bills contained summary proceedings for convicting offenders, so that a particular fine would automatically be attached to a given smoke pollution offence. In this way, the individual circumstances of each alleged nuisance ceased to be of legal importance. In the 1844 smoke abatement bill, a "Construction of Terms" section lays out various definitions for the purposes of the proposed legislation. It states that for the purposes of the proposed legislation, "the expression 'opaque Smoke' shall mean Smoke not transparent at the point of exit from the chimney …" It goes on to define numerous other terms relating to the commission of smoke offences, among them "furnace", "chimney", "works", and "occupier" of industrial premises.[56] Neither the nature nor extent of these items was supposed to require further consideration by a judge or jury beyond the definitions laid out in the legislation.

Overall, therefore, not only was the damage caused to public health by industrial smoke pollution taken to be an accepted fact (as described above), the definition of smoke pollution itself, more particularly the definition of what was considered an unlawful smoke emission, was also becoming axiomatic. This had the effect of removing the required judicial interpretation that had been such an important aspect of nuisance proceedings under the common law. As a result, the definition of industrial smoke pollution as an offence became significantly more rigid when defined in statutory terms. In addition, this detachment of the offence of smoke pollution from the requirement to prove its negative effects on property or the public's health and well-being in each instance likely contributed to the beginnings of an understanding of the pollution of an abstract environment or atmosphere by industrial processes as something detrimental in and of itself and in need of regulation.

Several occurrences immediately preceding the convening of the 1843 Select Committee and stemming from increasing concerns among local leaders about the smoke problem as well as the growing popularity of the local improvement Act smoke prohibitions provided impetus for William Mackinnon and his supporters to seek a new smoke law. In 1842, several initiatives helped raise the profile the smoke problem. Pressure was exerted from localities seeking to address the smoke pollution problem. In July of that year, a petition was presented to the House of Lords from London's mayor, aldermen and corporation requesting that some action be taken to curb industrial smoke pollution reported that the petitioners,

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[56] A Bill [as amended by the committee] To prohibit the Nuisance of Smoke from Furnaces or Manufactories. *BSP* 1844, vol. IV, 12 June 1844, p. 558.

> … complained of the injury done to the public buildings in the metropolis by the nuisance of smoke from factories, steam-vessels, &c., and they prayed for some measure by which those nuisances might be abated.[57]

It was also in 1842 that a public meeting on the problem of smoke pollution was held in Leeds. This was the same year that the *Leeds Improvement Act* was enacted, and the chair of the meeting was William Beckett, a Member of Parliament for Leeds who went on to play an important role in the committee proceedings of the 1840s concerning the smoke problem. As mentioned in Chapter Three, among the meeting's formal conclusions was a confident assertion that steam-engine furnaces could be made to operate cleanly, with fuel savings to be gained.[58] Smoke expert Charles Wye Williams, who mentioned the 1842 meeting in his essay on smoke prevention of 1857, further pointed out that by the time the Leeds meeting took place, the subject of industrial smoke pollution "had already received the attention of the highest chemical authorities of the age." Williams himself had published a treatise on smoke prevention in 1841.[59] These connections between local bodies and central legislators underscore the importance of the pursuit of workable smoke pollution law by local authorities as an impetus to those who took up the same pursuit at the national level.

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[57] *The Times*, 19 July, 1842, p. 2, col E.
[58] Quoted in C. W. Williams, *Prize Essay on the Prevention of the Smoke Nuisance* (London, 1857), pp. 8-9.
[59] C. W. Williams, *The Combustion of Coal and the Prevention of Smoke Chemically and Practically Considered*, 2nd edition (London, 1841). See also R. Armstrong, *An Essay on the Boilers of Steam* (London, 1839).

The drive for a national smoke law

One of the most striking aspects of William Mackinnon's involvement in the smoke debate was his unrelenting drive to seek a single, compulsory national smoke abatement Act. From the first time he requested the convening of the Select Committee on Smoke Prevention in 1843, Mackinnon clearly stated that he wished to seek a national smoke law. He mentioned the numerous existing smoke consumption clauses among local improvement Acts, and stated that he wished to investigate the possibility of creating national statutory provisions along similar lines. As he explained,

> Under some local acts there were provisions for compelling the factories to consume their own smoke, and he did not apprehend, therefore, that there could be any objection to a committee to inquire into the facts with a view to general legislation.[60]

This goal of national legislation remained of utmost importance throughout the Select Committee's proceedings.

With respect to law reform, by the early 1840s, the legislators who formed the Select Committee on Smoke Prevention appear to have been equally concerned with the practicability of passing a national anti-pollution Act as with accomplishing smoke abatement itself. Throughout the 1843 Committee proceedings, Committee members emphasised the importance of creating a law that would be national in scope.[61] This desire for one national Act that would encompass almost all of England's industries remained foremost among William

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[60] Hansard, *Parliamentary Debates*, 1843, LVV, p. 445.

[61] For example, see the Report from the Select Committee on Smoke Prevention; Together with the Minutes of Evidence, Appendix and Index. 17 August 1843. *BSP* 1843, VII, p. 381.

Mackinnon's goals throughout the 1840s. The drive for compulsory national legislation was in keeping with the new attitude toward legislation that developed between the 1820s and 1840s. This period is referred to as the "Age of Reform" or the "Age of Improvement" by many historians because of the previously unmatched use of legislation to foster positive social change and to attempt to bring under control the social and environmental consequences of industrialization and urbanization. It is seen to have begun after 1815 and England's return to peace and prosperity following the revolutionary and Napoleonic wars with France, and it was encouraged by the revolutionary changes that had occurred in France, which had fostered discussions of the possibility of radical improvements in English society, along with the profound social changes accompanying industrialization.[62] The emergence of the public health movement in this period helped encourage the application of this new approach to legislation to environmental matters.[63] As G. Kitson Clark explains, the "…struggle for public health … was the conscious pursuit of a social ideal, and it could only be developed by imposing on the community an ever-increasing body of rules…"[64]

A key theme of the "Age of Reform" was the attempt by the government to centralise powers in numerous areas that had previously been within local jurisdiction. This occurred after the Whigs took power in 1830 after many decades in opposition, and promised revolutionary changes in government and administration that would far exceed the reforms initiated by several Tory governments in the 1810s and 1820s.[65] As John Prest explains the political climate in these years, "[a]fter fifty years in the wilderness the Whigs were, perhaps, in the mood to take the part of a rational government in a brave nation and undertake a complete reorganization of the relations between central and local government."[66] In addition to the efforts of the Whigs in the 1830s, several of their initiatives survived and were continued into the 1840s by Sir Robert Peel's government.[67]

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[62] As G. Kitson Clark explains, in the industrial revolution period, "…it was proved early on that if the standards of humanity and well-being attained in the new mass-populated industrial community were to be compatible with the increasingly humane standards demanded by nineteenth-century society, increasing social discipline was necessary which must be imposed by some public authority." G. Kitson Clark, *The Making of Victorian England* (Cambridge, Mass., 1962), p. 108. See also Asa Briggs, *The Making of Modern England 1783-1867: The Age of Improvement* (New York, 1959).

[63] The 1828 Royal Commission on Water Supply is identified by many historians as the first large public health initiative. C. Hamlin, *A Science of Impurity: Water Analysis in Nineteenth Century Britain* (Bristol, 1990), p. 74.

[64] Kitson Clark, *The Making of Victorian England*, p. 108.

By the early 1840s, public health advocates figured prominently among the many supporters of a new national smoke pollution law. These same activists were also among the strongest advocates of the growth of centralised control and administration in a number of areas of social concern, including town improvement and nuisance removal measures. Foremost among them in this regard was Edwin Chadwick, a champion of the public health movement throughout the 1830s and 1840s. Chadwick and his supporters sought to attack sanitary and public health problems through the use of robust national legislation. As M. W. Flinn explains, Chadwick's proposals "involved a very substantial extension of the powers of both local and central government."[68] Chadwick's first large public health initiative was the *New Poor Law* of 1834. It was the most radical reform effected in this period, as it created new units of local administration called poor law unions which superceded several ancient local units, in particular counties and parishes. Following the *New Poor Law*, successive Whig governments had to find a compromising balance between their drive for greater centralisation and the predominant belief in the importance of local self-government. They did this by enacting a large body of permissive legislation, or Acts that provided model clauses for local authorities that wished to enact legislation such as local improvement Acts.[69] This form of legislation had already been used by the Tory government of Lord Wellington between 1828 and 1830, but was adopted on a much wider scale in the 1830s. By 1850, however, as it became increasingly clear that permissive legislation was not always successful, support for a movement away from permissive, "laissez-faire" legislation and toward centralised, compulsory legislation grew, and consequently so did the amount and scope of environmental law.[70] The pollution of the Thames, for example, once considered a matter of local government, came to be considered a problem in need of national regulation by 1850.[71] The *Public Health Act* of 1848 (although in fact a permissive act) and the *Nuisance Removal and Diseases Prevention Acts* of 1846 and 1848 were also enacted with similar goals of establishing central control over a wide array of problems of social dislocation, public health, and pollution in the new industrialized English society.

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[65] Anthony Brundage argues that following the passage of the 1832 *Reform Act*, "the Whigs presided over one of the most extraordinary periods of government growth in British history." A. Brundage, *England's 'Prussian Minister': Edwin Chadwick and the Politics of Government Growth, 1832-1854* (University Park and London, 1988), pp. 28-29. See also A. Briggs, *The Making of Modern England 1783-1867: The Age of Improvement*, ch. 5. Additionally, Asa Briggs points out that following the death of George IV in 1830, a decline of royal power made the reforms of the 1830s easier to initiate. See Briggs, *The Making of Modern England 1783-1867*, pp. 186-187.

[66] J. Prest, *Liberty and Locality: Parliament, Permissive Legislation, and Ratepayers' Democracies in the Nineteenth Century* (Oxford, 1990), p. 14.

[67] Briggs, *The Making of Modern England 1783-1867: The Age of Improvement*, pp. 325-343.

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[68] M. W. Flinn's introduction to E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain*, edited with an introduction by M. W. Flinn (Edinburgh, 1965), p. 38. For this view in a wider context than only the work of Chadwick, see also A. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London, 1983), p. 222.

[69] J. Prest, *Liberty and Locality: Parliament, Permissive Legislation, and Ratepayers' Democracies in the Nineteenth Century* (Oxford, 1990).

[70] Prest, *Liberty and Locality: Parliament, Permissive Legislation, and Ratepayers' Democracies in the Nineteenth Century*, pp. 209-217.

[71] B. Luckin, *Pollution and Control: A social history of the Thames in the nineteenth century* (Bristol and Boston, 1986).

In the area of smoke pollution, Chadwick expressed a very similar desire for centralization of power to encourage social improvement and a strong national smoke law.[72] He also outlined his lack of faith in local enforcement in his renowned *Report on the Sanitary Condition of the Labouring Population of Great Britain*, published in 1842. He pointed out that in many places, the local authorities that were responsible for suppressing smoke nuisances were largely neglectful in that regard. This was particularly disturbing considering the extent of the smoke problem clearly visible in many localities. As he explained,

> The chimneys of the furnaces which darken the atmospheres, and pour out volumes of smoke and soot upon the inhabitants of populous towns, afford most frequent examples of the inefficiency of the local administration, and the contempt of the law for the protection of the public against nuisances which are specially provided for.[73]

In addition, Chadwick mentioned the 1821 *Smoke Prohibition Act* and described its provisions, and pointed out that many local improvement Acts also contained smoke consumption clauses relating to steam engines. However, he also noted that it was difficult for local authorities to act in situations in which the same men who comprised the local government bodies were also the factory owners causing the smoke pollution. One local officer of the peace who was asked why so much smoke continued to be emitted by the factories in his jurisdiction stated, "that the chief members of the Board were the persons whose furnace-chimneys were most in fault", and, as a result, "he appealed whether a man in his condition was to be expected to prosecute his patrons?"[74] Thus there were several ways in which purely local enforcement of environmental standards appeared woefully inadequate to Chadwick.[75] Chadwick's drive for strong national regulation was shared by William Mackinnon. When viewed in this light, Mackinnon's desire to enact a national, compulsory smoke prohibition appears to have been in accordance with the predominant legislative philosophy of the 1840s, which was particularly popular among public health reformers. This helps explain why he sought to replace the 1821 *Smoke Prohibition Act*, since it was the type of reactive, "laissez-faire" legislation that had come into such disrepute by this time.

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[72] S. E. Finer argues that Chadwick "astonished his contemporaries by claiming ever wider fields as proper to state enterprise." S. E. Finer, *The Life and Times of Sir Edwin Chadwick* (London, 1952), p. 475.

[73] E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain*, edited with an introduction by M. W. Flinn (Edinburgh, 1965), p. 355.

The view of national statutes as the optimal form of social regulation and progress undoubtedly helps to explain why the legislators of the 1840s were so eager to propose such strong smoke pollution legislation and, in addition, so willing to ignore other forms of regulation, in particular those involving local governments. The frequency with which members of Parliament opposed to Mackinnon's smoke abatement bills advocated greater local powers to create and enforce anti-pollution rules without any success is striking.[76] In a House of Commons debate in June,

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[74] Ibid, p. 357.

[75] See also Finer, *The Life and Times of Sir Edwin Chadwick*, pp. 228, 477. A very similar attitude toward local enforcement of environmental standards was expressed by the epidemiologist Dr. John Snow, who in 1869 argued that the governmental mechanisms available for the enforcement of public health standards required substantial expansion in order to eradicate "that form of liberty to which some communities cling, the sacred power to poison to death not only themselves but their neighbours." Quoted in A. Briggs, *Victorian Cities*, p. 20.

[76] For an interesting discussion of concerns of the Radical and Tory opponent of the Whigs' attempts to centralise many powers, see F. B. Smith, *The People's Health 1830-1910* (New York, 1979), p. 199.

1849, for instance, two out of the seven members who spoke on Mackinnon's latest bill appealed to Mackinnon and the Attorney General that,

> … the best course would be to empower the municipal council of every borough to undertake the prevention of nuisance by smoke, seeing that they, from their local knowledge, were best calculated to consider the circumstances of the place with regard to manufactures.[77]

Similar pleas were also made outside of Parliament, again to no avail. Several authors of letters to *The Times* raised the same point. One letter from "A Manufacturer" complained that the proposed bill would make any polluting factory subject to penalties, regardless of where it was located and argued that,

> … the amount of nuisance and necessity for rendering the consumption of smoke compulsory is dependent to a great extent upon the number and proximity of the engines and height of their chimneys; and the local authorities of towns are competent judges when the number arrives at that point that it becomes necessary for the public benefit to put a prohibition upon the smoke, and more especially to compel the owner of any furnace to be erected in future to render to his chimney smokeless…[78]

Part of this disregard for local government likely stemmed from the great changes to local government effected by the 1835 *Municipal Corporations Act* and outlined in Chapter Three. Municipal reforms that greatly limited the role of the Courts of Quarter Sessions and the long gaps that then opened up between this decline of the traditional enforcement mechanisms at the local level and the rise the various committees established by the new municipal councils, such as committees for sewerage, sanitation, nuisance removal, etc., in the mid-nineteenth century likely eroded faith in local enforcement. At the same time, at the national level, it was also not until 1847 that a model smoke prohibition clause was provided to the new borough councils in the 1847 *Town Improvement Clauses Act.*[79] It is therefore perhaps not surprising that Mackinnon looked to the model provided by the compulsory smoke consumption clauses contained in various local improvement Acts, yet sought to create one nationally applicable smoke prohibition rather than seeking to expand the powers of local authorities to control industrial pollution on a local basis.

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[77] Hansard, *Parliamentary Debates*, June 6, 1849, col. 1261. The reply of the Attorney General to this appeal is particularly interesting. He stated that, "it was because municipal boroughs could not make regulations for the prevention of smoke, that a general measure had been deemed necessary for the purpose." (also col. 1261). In fact, only two years earlier, the *Town Improvement Clauses Act*, 1847, (10 & 11 Vict. c. 34) had given all towns and districts a model smoke prohibition clause which they could adopt by a local act of Parliament. This discrepancy remains obscure to me.

[78] *The Times*, 15 July, 1845, p. 7, col. E.

To sum up, at the same time that widespread interest in pollution control continued to exist among industrialists and legislators, there developed new, unprecedented interest in law reform and municipal reform. In particular, in the 1830s and 1840s centralisation with respect to government was pursued in unprecedented ways. The result of these two overlapping factors—continued optimism with respect to smoke pollution control and new interest in law reform—was that a significant group of people favouring environmental legislation emerged at the very time at which national legislation was coming to be seen as the optimal form of regulation.

Further influence of the public health movement

Edwin Chadwick's influence on the smoke debate extended beyond his advocacy of national, compulsory legislation. In 1842, he published his *Report on*

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[79] This Act was not compulsory, however. It offered a model smoke prohibition clause that could be adopted by localities seeking to draft a local improvement Act to save time in the drafting process. Its passage was, however, clearly an attempt to take some action with regard to smoke pollution following the failed attempts of 1843-1846.

the Sanitary Condition of the Labouring Population of Great Britain in 1842.[80] In 1838, Chadwick, was recruited by the government to conduct a national study on sanitation problems. His 1842 *Report* was based on extensive testimony collected by local health officials across England. Chadwick mentioned smoke pollution among the many environmental problems plaguing the working poor, and called for action to be taken. His work galvanized the public health movement and provided inspiration to public health activists within and outside of government who began to fight for the reforms which ultimately culminated in the 1848 *Public Health Act*. Chadwick's *Report* thus brought smoke within the realm of the public health movement. As S. E. Finer explains, by the late 1840s, "...the Public Health movement was now approaching flood tide, and Chadwick, on Press and platform, was its hero."[81]

It was public health advocates who shared Chadwick's concerns who first brought the issue of industrial smoke pollution back to national prominence in the political sphere in the early 1840s. Foremost among them with respect to the smoke problem was William Mackinnon, one of the earliest members of Parliament to advocate far-reaching public health law. From the beginning of the 1840s he sought to draft legislation prohibiting the burial of bodies in urban areas, legislation prohibiting cruelty to animals, as well as smoke abatement legislation. His interest in smoke abatement arose from his chairmanship of the Committee on the

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[80] E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain*, edited with an introduction by M. W. Flinn (Edinburgh, 1965).
[81] Finer, *Life and Times of Sir Edwin Chadwick*, p. 293.

Improvement of the Health of Towns which he held in the early 1840s.[82] In 1840 and 1841, he repeatedly urged the government to investigate the public health of England's towns, thereby helping to bring the matter to national prominence.[83] Throughout the 1840s, Mackinnon remained the unrelenting champion of the smoke abatement bills brought before the House of Commons.

One reason for the sustained interest in smoke abatement among public health activists was likely the commonality evident between the perceived nature of smoke pollution and the predominant understanding of epidemic disease. As seen in Chapter One, prior to the nineteenth century, smoke pollution was considered analogous to a wide variety of unpleasant smells. However, as perceptions of disease changed in the early nineteenth century, smoke appears to have taken on new meaning as it came to be viewed as an environmental ill contributing to the propagation of contagious disease. This gave added urgency to the quest for a new smoke law, particularly as fears of epidemics grew in the 1830s and 1840s. As a result, the traditional emphasis on property ownership that was integral to common law nuisance became less important to public health activists, whose concerns centred on finding ways to curb the very high rates of mortality in England's urban areas among the country's most vulnerable people.

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[82] *The Times*, 30 March, 1844, p. 6, col. C. It is interesting to note that Sir Henry Thomas de la Beche and Dr. Lyon Playfair were also members of the Health of Towns Commission. Therefore, when these men were commissioned to write their report in 1846, although they were arms-length, impartial experts by comparison with many of the Committee members of the earlier 1840s, they were nonetheless familiar with public health concerns and active participants in the growing movement to improve the urban environment. See *The Times*, 8 May, 1844, p. 6, col. C.

[83] "Mr. Mackinnon gave notice, that he would bring on Tuesday his motion respecting the health of towns." "Parliamentary Intelligence", *The Times*, 30 July, 1840, pg. 3, col. C.
"Mr. Mackinnon gave notice, that on Friday next he would call the attention of the house to the report of the committee on the health of towns." "Parliamentary Intelligence", *The Times*, 30 January, 1841, p. 3, col. B.
"Mr. Mackinnon said, that it was not his intention to proceed with his motion for a committee relating to the health of towns, as the subject had been taken up by the Government in the other house." "Parliamentary Intelligence", *The Times*, 3 March, 1841, p. 3, col. C.

The early public health advocates held a particular understanding of contagious diseases, termed miasma theory or pythogenic theory, which paralleled their conception of smoke pollution.[84] The theory held that contagious diseases spread through the atmosphere in the form of vapours or cloudy masses. These vapours then descended upon a particular population, causing an epidemic to occur. The similarity between this new view of disease and smoke pollution was often clearly articulated in the mid-nineteenth century. A report on the most recent quarterly public health returns from local districts compiled by the Registrar-General in August, 1848, for example, contained a lengthy discussion of influenza. It was summarised in *The Times*, in which article the authors described the components in the air that it was believed produced influenza as follows:

> They are most probably in a state of suspension; hang, like the smoke in cities, over the places in which they are produced, but are spread and driven about like vesicular water in clouds. … The emanations from the living, the graves, the slaughterhouses, the heaps of filth rotting, the Thames—into which the sewers still empty—raise over London a canopy which is constantly pervaded by zymotic matters …[85]

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[84] A. S. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London, 1983), p. 215; A. Beck, "Some Aspects of the History of Anti-Pollution Legislation in England, 1819-1954", *Journal of the History of Medicine* (October, 1959), pp. 475-489; J. M. Eyler, *Victorian Social Medicine: The Ideas and Methods of William Farr* (Baltimore, 1979), ch. 5; for miasma theory in the eighteenth century see A. A. Rusnock, *Vital Accounts: quantifying health and population in eighteenth-century England and France* (New York, 2002), p. 29. L. C. B. Seaman notes that such renowned public health advocates as Edwin Chadwick and Florence Nightingale "remained miasmatics all their lives" despite compelling evidence against the miasmatic generation of disease put forward by experts such as Dr. John Snow, an epidemiologist and medical practitioner in London. L. C. B. Seaman, *Victorian England: Aspects of English and Imperial History 1837-1901* (London and New York, 1973), pp. 48-49.

[85] *The Times*, 9 February, 1848, p. 6, col. E.

A few months later, the *Health of Towns Bill* was amended to exempt London and the metropolitan area from its provisions. An editorial in *The Times* lamented this change, and listed several public health problems plaguing the metropolis and in need of remedy. Industrial pollution was included in these and described as "deleterious effluvia":

> One monster evil remains untouched. London is to retain the full usufruct of its chartered filth. … the wells are deeply polluted, if not actually poisoned—sewers are rendered offensive beyond measure by the infiltration of water passing through graveyards, manufactories emit deleterious effluvia, the filthy and overcrowded lodging houses are the seats of contagious disease, but London has its charter and its local interests, so these things for the time must be suffered to remain.[86]

By the end of the 1840s, experts lacked concrete evidence of links between smoke pollution and disease and deteriorating public health. In 1850, Sir John Simon, Medical Officer of Health for London, was asked his opinion of the 1850 Bill and asserted that the goal of smoke eradication was "highly desirable". He pointed out that although it was as yet impossible to prove any direct link between smoke pollution and the health of individuals living in London, there were indirect links that were indisputable. The severe levels of smoke pollution in the metropolis induced many residents to keep their windows shut too much of the time, so that their houses became "fusty or stinking", leading to health problems.[87] Once again, smoke pollution was seen to contribute to the "corruption" of the air breathed by the London population, which in turn harmed the public health.

Therefore, by the 1840s the miasma theory had grown in popularity to become part of the public discourse on public health found in such media as *The*

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[86] *The Times*, 10 August, 1848, p. 5, cols E-F.
[87] *The Times*, 5 July, 1850, p. 8, col. F.

Times, and industrial smoke pollution was perceived as a form of disease-carrying vapour or effluvia. Although lacking strong evidence of this link, public health activists continually described smoke pollution in terms of the miasma theory and this perceived connection between smoke and disease likely helped to keep industrial smoke pollution among the top priorities of such activists.

Another common theme touched on by historians who examine environmental matters in the nineteenth century is that of the economics of improvement and public health projects. Nineteenth-century reformers continually phrased their ideas in terms of economy, emphasising the savings that could be expected to accrue from their proposed reforms. Asa Briggs, for instance, argues that "throughout the Victorian age the most effective argument for sanitary reform was that it would actually save money in the long run, not squander it."[88] He points out that "civic economy" was a branch of political economy focusing on the costs and benefits of enacting civic improvements. This line of analysis was used by public health activists, who argued that the prevention of disease was more economical than the costs of allowing it to spread and its treatment.[89] Bill Luckin raises a similar point in relation to the pollution of the Thames. In his *Pollution and Control*, he argues that the "economic orthodoxy" of the mid-nineteenth century required that any improvement schemes had to prove profitable in order to be taken seriously. In relation to sanitation, for instance, this led reformers to develop plans to sell human waste to farmers outside of London, thus ensuring the sustainability of the clean-up plans.[90]

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[88] A. Briggs, *Victorian Cities*, p. 21.
[89] Ibid.

Analogous economic analysis was performed by the advocates of new smoke legislation in the 1840s and early 1850s. As will be seen below, they argued that the costs imposed on communities by smoke pollution far outweighed the costs of implementing clean-burning furnace technology. The costs accumulated in the form of poverty resulting from debilitating disease, lower worker productivity due to generally deteriorating health, and increased washing and sanitation costs. Such analyses were mobilized to counter economic arguments put forward by opponents of the smoke bill who emphasised the poor economic conditions prevalent in the 1840s and the insurmountable financial burdens that legislated smoke abatement would ostensibly place on them.

Edwin Chadwick was one of the first writers to articulate this line of argument. He emphasised the burdens placed on both working class and more affluent families in the attempt to remain clean and healthy in England's industrial centres. He argued that the development of habits of cleanliness among the working classes was in danger of being arrested as smoke pollution increased, describing the swelling tide of pollution as "an impediment to the formation and maintenance of habits of person and household cleanliness amongst the working classes." The costs exacted from the wealthier classes were even higher, for whom, "the nuisance of an excess of smoke … operates as a tax increasing the wear and tear of linen and the expense of washing, to all who live within the range of the mismanaged chimneys."[91]

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[90] B. Luckin, *Pollution and Control: A social history of the Thames in the nineteenth century* (Bristol and Boston, 1986), pp. 13-14.

In the same year that Chadwick's *Report* was published and presented to Parliament, a committee of the Metropolitan Improvement Society published a circular threatening industrialists with legal action. The committee asserted that, "in case some plans are not speedily adopted to put an end to the nuisance of smoke, to proceed against them by the common law, or enforce the provisions of Michael Angelo Taylor's Act."[92] The committee sought to follow the lead of local smoke suppression societies formed at Manchester and Leeds, which had succeeded in undertaking similar legal action. In addition, it was noted that in Manchester, research had revealed that the difference in washing costs between weekdays and Sundays amounted to at least a half-penny per person in the homes of the working classes. They concluded that, "[t]his for Manchester alone would amount to a charge upon the inhabitants of [£]30,000 per annum, and in London, at the same average, to an annual charge of [£]162,520."[93] Such considerable sums must have raised the interest of those aware of the smoke problem and the smoke legislation debate.

This economic argument was articulated repeatedly throughout the 1840s and leading up to the passage of the *Metropolitan Smoke Abatement Act*. In 1850, when Sir John Simon was asked whether he supported smoke abatement legislation,[94] he listed both public health considerations and economic benefits as factors encouraging national smoke legislation. He first pointed out the huge financial losses sustained by people whose property was damaged by smoke:

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[91] E. Chadwick, *Report on the Sanitary Conditions of the Labouring Population of Great Britain*, edited with an introduction by M. W. Flinn (Edinburgh, 1965), p. 356.
[92] *The Times*, 3 November, 1842, p. 6, col. D.
[93] Ibid.

> The injury to property by smoke is notorious; it consists partly in the first fact of its incrusting, and in some cases corroding, whatever surfaces are exposed to its action, rendering buildings dingy and dirty, blackening marble statues, obliterating inscriptions, defacing pictures, &c.[95]

Simon then added the costs, imposed particularly heavily on the working classes, of the extra cleaning required to remove soot from buildings, clothing, furniture, etc., in a manner almost identical to Chadwick's arguments eight years earlier. While he admitted it was impossible to calculate these costs precisely, this form of damage "may be described as a very heavy annual tax on persons using clean linen".[96]

In presenting an economic argument that countered the powerful claims of undue financial distress made by opponents of smoke abatement legislation, smoke law proponents were able to paint their public health concerns in a positive economic light that promised savings on a national scale. This likely helped to make the creation of a new, more robust smoke law more palatable to the public as well as legislators who otherwise doubted the merits of such law.

Conclusion

The decade spanning William Mackinnon's first attempts to create national smoke prohibition legislation in 1843 and the passage of the 1853 *Metropolitan Smoke Abatement Act* was characterized by repeated attempts to enact a new, national smoke pollution law that would uniformly and comprehensively prohibit the emission of industrial smoke pollution. The legislation drafted in this period differed significantly from the 1821 *Smoke Prohibition Act*, embodying a new conception of smoke pollution separated from the key components of common law nuisance.

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[94] See note 85 above.
[95] *The Times*, 5 July, 1850, p. 8, col. F.
[96] Ibid.

The model that William Mackinnon and his supporters initially looked to was that provided in the smoke provisions written into numerous local improvement Acts in the 1820s to 1840s, which was then adapted in the attempt to create a definitive national statutory smoke prohibition. No longer was the common law definition of nuisance adequate for a problem of such magnitude and one affecting so many large groups of working people lacking any property interests. Thus, legislators sought a national smoke prohibition to meet what they perceived to be new needs.

The 1840s saw broader public support and encouragement for a new smoke law to replace the 1821 *Smoke Prohibition Act*. As increasing numbers of people favouring new prohibitory smoke legislation emerged, their support added dimensions of meaning to the issue of smoke pollution. Foremost among them, public health advocates helped industrial smoke pollution evolve, from being considered a nuisance to become a pressing matter of national public health, linked to England's shameful death rates and horrible urban enclaves of poverty, disease and filth.

The decade-long drive for a definitive smoke law was not ultimately fully successful. As public health law began to take root, smoke pollution control failed to make it into the 1848 *Public Health Act*. There was some success in 1853, with the passage of the *Metropolitan Smoke Abatement Act*, albeit it in a form greatly restricted in comparison to the smoke bills of the 1840s. There followed a period of several decades during which the strict pollution provisions so avidly sought by William Mackinnon and like-minded supporters were gradually altered and qualified so that they became increasingly weaker, to the point at which the smoke provisions in the 1875 *Public Health Act* were, arguably, little more forceful than those in the 1821 *Smoke Prohibition Act*. Thus, while public health law as a whole grew steadily in scope, coherence and strength, smoke pollution law began to lose much of those attributes. These developments will be discussed in Chapter Five.

Chapter 5. The 1875 *Public Health Act*: The Creation and Consolidation of a Regressive Body of Smoke Law

Introduction

This thesis challenges the interpretation widely held among historians and legal scholars that the smoke pollution legislation of the second half of the nineteenth century, in particular the 1875 *Public Health Act*, effectively marked the beginning of modern English environmental law. Such historians tend largely to neglect the initiatives undertaken in the early nineteenth century, as outlined in earlier chapters. The analysis provided by A. R. Meetham sums up this interpretation:

> The first real attempt to control smoke came in 1875 with the *Public Health Act* of that year which introduced the concept of smoke abatement whilst as early as 1863 the Alkali Act of that year had recognized the special problems associated with certain industrial non-combustion processes and introduced the now accepted concept of 'best practicable means' and the Alkali Inspectorate who were to administer its provisions, the remit of which has gradually increased with the passage of the current Alkali, etc., Works Registration Act, 1906.[1]

Very similar arguments can be found in the work of several legal scholars, for example Roger Butterfield and Jessica Holroyd, who argue in their book, *Statutory Nuisance*, that public health issues were dealt with in "a piece-meal fashion during the nineteenth century". This only changed in 1875, as they explain: "Reform came with the comprehensive *Public Health Act* 1875 which created the foundation of modern law, including that relating to statutory nuisances."[2] David Hughes *et al.* emphasise the foundational nature of the same Act when they argue that its enactment, "achieved a rationalized and codified law of sanitation and health, but it only ushered in a period when mortality could begin to fall."[3]

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[1] A. R. Meetham, D. W. Bottom, S. Cayton, A. Henderson-Sellers, D. Chambers, *Atmospheric Pollution: Its History, Origins and Prevention*, 4th ed., (Oxford, 1981), pp. 207-208.

[2] R. Butterfield and J. Holroy, *Statutory Nuisance: A Guide for Professionals* (Sudbury, Suffolk, 2000), p. iii. See also R. McCracken et al., *Statutory Nuisance* (London, 2001), p. v.

Public health historians tend to view the 1875 *Public Health Act* in the same light. F. B. Smith, for example, argues that the *Public Health Acts* of 1872 and 1875 "finally consolidated the great mass of nuisance, public health, infectious diseases, sewers, slaughtering houses and water-supply legislation for England and Wales."[4] A slightly different interpretation is offered by public health historian Anthony Wohl, who points out the limitations of the 1875 Act, in particular its failure to create a central smoke pollution inspectorate. He argues that although the Act consolidated several nuisance provisions, the failure to provide a national inspectorate had the result that, "the quality of the nation's air down to the end of the century was left a matter of negotiation between local authorities and local manufacturers."[5] While Wohl's interpretation of the 1875 Act differs from that of Meetham, Butterfield and Holroy, and Hughes *et al.*, it shares the view of early-nineteenth-century pollution initiatives as inadequate and unsuccessful, while extending that interpretation into the twentieth century.

Chapters One to Four have shown that the legislative attempts of the first half of the nineteenth century were significantly more extensive and more far-reaching, in their conception of smoke pollution and the means for controlling it, than would appear from existing secondary literature. The present chapter will build upon the preceding ones in order to offer a new interpretation of the nature and merits of the 1875 *Public Health Act* smoke pollution provisions.

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[3] D. Hughes et al., *Environmental Law* (London, 2002), pp. 3-4.
[4] F. B. Smith, *The People's Health 1830-1910* (New York, 1979), p. 199. The 1872 *Public Health Act* dealt mostly with the administrative mechanisms through which local authorities enforced public health provisions.
[5] A. S. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London, 1983), ch. 8.

This chapter will describe the continued efforts, after the passage of the 1853 *Metropolitan Smoke Abatement Act*, to create national smoke pollution legislation. These efforts culminated in the inclusion of statutory smoke provisions in the 1875 *Public Health Act*. However, rather than seeking a national smoke prohibition, as had William Mackinnon and his supporters in the 1840s, by the second half of the nineteenth century legislators sought to include smoke provisions in several other, broader pieces of legislation. As a result, the number of smoke consumption clauses in force multiplied, causing confusion regarding the status of the smoke law and its enforcement. Finally, in 1875, smoke provisions of national applicability were enacted as part of the second *Public Health Act*.

The 1875 *Public Health Act* is generally regarded by historians as the realization of the attempts of several decades to draft a new national smoke law. The importance of the Act with respect to its consolidation of a variety of public health issues is indisputable. Additionally, however, on closer examination it becomes clear that the smoke provisions laid out in it contained a combination of notable similarities and differences in relation to earlier smoke abatement legislation. When considered together, the combination of these similarities and differences amounted to the creation of a markedly conservative and regressive body of smoke law.

To ascertain the regressive nature of the 1875 *Public Health Act* smoke provisions, it is necessary to examine several influential factors that informed their creation. First, the 1875 Act drew upon not only smoke abatement clauses already in force, but also nuisance removal and public health law. This merging of distinct types of legislation into one Act led to the insertion of smoke pollution clauses modeled on earlier smoke abatement law into a very different context which gave the smoke provisions new meaning. In addition to their legislative origins, the 1875 smoke provisions differed significantly from earlier smoke prohibition clauses in that they contained several concepts and clauses integral to smoke pollution legislation since the early nineteenth century but which had grown to be contested and reinterpreted in a more conservative fashion. The latter part of the chapter will discuss the changing understandings of the "best practicable means" test, the concept of "reasonableness" with respect to the nature and location of industrial activity, and the legal responsibilities of industrial owners and workers. Each of these came to be understood differently by the later nineteenth century, and, in their articulation in the 1875 Act, together combined to afford greater protection to industrialists over their workers and the environment.

Smoke legislation 1853-1875

Chapter Four outlined the decade-long quest for a new smoke abatement law which terminated with the passage of the *Metropolitan Smoke Abatement Act* in 1853. While some success was achieved with the passage of that Act, the protracted debate concerning the merits of a new national, prohibitory smoke law was also accompanied by several problematic developments which became visible in its aftermath.

The first notable problem was that in the 1840s, a process of proliferation of statutory smoke provisions began. This eventually caused confusion concerning the state of existing smoke pollution law, and contributed to the change of approach to such legislation evident by 1875 when the second *Public Health Act* introduced national smoke pollution provisions.

Between the 1843 Report of the Select Committee on Smoke Prevention and the passage of the 1853 *Metropolitan Smoke Abatement Act*, smoke abatement clauses were in fact included in numerous other successful pieces of legislation. Local improvement Acts which included compulsory smoke consumption clauses continued to be enacted.[6] An attempt by the government to consolidate such clauses of local application was made in 1847 with the enactment of the *Town Improvement Clauses Act*. This was the form of permissive legislation termed "model Acts"[7], which provided model clauses for local authorities to adopt, and could be voluntarily adopted at the discretion of localities. Section 108 stated that,

> Every fire-place or furnace constructed after the passing of the special Act, in order to be used within the limits of such Act in the working of engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, gasworks, or in any manufactory whatsoever (although a steam-engine be not used or employed therein) shall be so constructed as to consume the smoke arising from the combustibles used in such fire-place or furnace ...[8]

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[6] For instance, for the 1840s see the *Salford Improvement Act*, 7 Vict., c. 33 (1844), s. 85. In the 1850s, Acts were passed that imposed smoke prohibitions in Birmingham, Leeds (which had already imposed a smoke prohibition in the *Leeds Improvement Act* of 1842), Liverpool, Manchester, Newcastle-upon-Tyne, Sunderland, and Wolverhampton. See R. A. Wright, *Smoke, its Cause and Means of Prevention* (London, 1866), p. 11.

[7] W. G. Lumley and E. Lumley, *The New Sanitary Laws* (London, 1871), p. 5.

[8] *An Act for consolidated in One Act certain Provisions usually contained in Acts for paving, draining, cleansing, lighting, and improving Towns (Town Improvement Clauses Act)*, 10 & 11 Vict. (1847), c. 34, s. 108.

The *Local Government Act* of 1858 adopted the smoke provisions contained in the *Town Improvement Clauses Act*, with a number of qualifying clauses. The 1858 Act provided several amendments to the 1848 *Public Health Act* and, while it remained fundamentally a permissive statute, the later Act was more forceful in its application than the earlier one.

Although the *Town Improvement Clauses Act* and the *Local Government Act* did provide standardised smoke prohibition clauses, they were adopted in varying degrees by different localities. The extent to which their adoption could vary was emphasised by Robert Wright in his 1866 treatise on smoke prevention when he noted that the smoke prohibition clause in the *Town Improvement Clauses Act* was, "… as appears to us, exceedingly ambiguous—at any rate, it may be so twisted as to exempt some of the most notoriously smoky furnaces—though, on the other hand, it might be made a formidable weapon against the smoke nuisance if wielded by a determined bunch of magistrates."[9] The decision to draft the *Local Government Act* so that it incorporated the smoke clause of the *Town Improvement Clauses Act* but then added qualifications to it could also prove problematic. In the case of Wolverhampton, for example, the *Local Government Act* was brought into force while a local improvement Act which incorporated the *Town Improvement Clauses Act* smoke clause remained on the books.[10] Such situations were bound to cause significant confusion regarding which clauses took precedence and which qualifications and exemptions applied to what industries.

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[9] R. A. Wright, *Smoke, its Cause and Means of Prevention* (London, 1866), p.12.
[10] Wright, *Smoke, its Cause and Means of Prevention*, p.12.

The enforcement of smoke prohibitions saw a similar amount of ambiguity and growing confusion. In cases where a locality was subject to more than one piece of smoke legislation, such as in Wolverhampton, the enforcement of any of them could be delayed, sometimes for several years. In Newcastle, for instance, a three-year period lapsed between the first adoption of a smoke prohibition and the first action taken to secure prosecutions. Some local governments zealously enforced their smoke laws, while others were either haphazard or simply neglectful in their enforcement.

Finally, perceptions of the effects of such smoke provisions appear to have varied too. Robert Wright cited several reports submitted from local authorities to the Home Office in the mid-1860s concerning the smoke problem. He noted that Manchester had reported "marked improvement" of the smoke problem, and revealed his lack of faith in such an assessment by observing that, "what Manchester must have been before this marked improvement it is difficult to say."[11] As smoke pollution grew increasingly ubiquitous, it is likely that the perceptions of those suffering in its midst evolved in consequence.

In addition to the problems found in the proliferation of local smoke prohibition legislation, some slightly different anti-pollution clauses were enacted in other types of legislation. Under the *Metropolitan Buildings Act* of 1844, for example, "noxious buildings" (i.e. industrial premises emitting pollution) were required to be built at least fifty feet from private houses and at least forty feet from any "public way", and the Act ordered existing noxious buildings not in compliance with the law to move or cease operation within thirty years. Alternatively, two Acts in 1845 prohibited the emission of smoke on railways from steam locomotives in England and Scotland. With respect to Scotland, a smoke abatement Act similar to the *Metropolitan Smoke Abatement Act* but applicable in Scotland was enacted in 1857.[12] The *London Sewers Act* also included such a clause, of applicability only to London according to its narrowest definition.[13]

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[11] Ibid.

Altogether, the growth of smoke abatement clauses across a variety of Acts, in combination with the many different local Acts and the uneven local adoption of some such legislation, made the enforcement of anti-pollution legislation increasingly difficult. Despite the efforts to increase the scope of the 1853 Act, by 1860 smoke abatement legislation had become very complicated and difficult to be fully aware of, let alone to enforce.

This state of confusion with respect to smoke abatement law was discussed before a Select Committee convened in 1862 to investigate noxious vapours (the committee that drafted the 1863 *Alkali Act*).[14] The Committee Report outlined the extent of the existing smoke abatement clauses contained in the various statutes, and a number of witnesses commented on them. One very interesting witness was Tom Taylor, Secretary to the Local Government Act Office (which replaced the General Board of Health and in 1871 was in turn replaced by the Local

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[12] W. Robertson and A. McKendrick, *Public Health Law: An Epitome of Law Applicable to England and Wales and Scotland* (Edinburgh, 1912), p. 134.

[13] It was the smoke prohibition in the *London Sewers Act* that the London Medical Officer of Health, Sir John Simon, sought to extend, far beyond the boundaries of London, to the entire metropolitan area. It was this goal that led him to take up the quest for new smoke law upon William Mackinnon's retirement, which proved instrumental in the creation of the 1853 *Metropolitan Smoke Abatement Act*.

[14] Report from the Select Committee of the House of Lords, on Injury from Noxious Vapours, 1 August 1862. *BSP* 1862, XIV, pp. 1-319.

Government Board[15]), who testified that even he had trouble interpreting the various smoke abatement clauses in existence. The example he cites from the *Local Government Act*, 1858, reveals very effectively the state such clauses had reached by this time. Section 108 of the *Town Improvement Clauses Act*, 1847, (quoted above) was adopted by the *Local Government Act*, but with the qualification that the section was,

> … subject to this Qualification, that the above-mentioned Provisions with respect to the Prevention of Smoke shall not extend to compel the Consumption of all Smoke in the Case of all or any of the Processes following; that is to say, to the coking of Coal, the calcining of Ironstone or Limestone, the making or burning of Bricks, Earthenware, Quarries, Tiles, or Pipes, the raising of any Mines or Minerals, the smelting of Iron Ores, the refining, puddling, shingling, and rolling of Iron or other Metals, or to the melting and casting of Iron into Castings, or to the Manufacture of Glass, in any District where the Provisions of the said Act for the Prevention of Smoke are not now in force, in which the Local Board shall resolve that any One or more of such Processes should be exempted from Penalties for not consuming all Smoke for any Time specified in such Resolution, not exceeding Ten Years, which may be annually renewed for a similar or any shorter Period, if the Board shall think fit …[16]

Taylor then testified that this Act had required significant debate and compromise between various parties, and that ultimately, "I doubt whether at the end the House of Commons were quite clear as to the meaning of what they were passing …"[17] The committee, although it was investigating noxious vapours, another form of industrial pollution, took the opportunity to recommend that smoke pollution and noxious chemical emissions should be legislated together, and that the provision in the *Metropolitan Smoke Abatement Act*, 1853, respecting offensive trades, should be made universally applicable.[18] In that way, they argued, the law concerning industrial atmospheric pollution would be made uniform, universal, and comprehensible.

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[15] W. G. Lumley and E. Lumley, *The New Sanitary Laws* (London, 1871), p. xvii.
[16] *Local Government Act*, 1858, 21 & 22 Vict. (1858), c. 98, s 45.
[17] Report from the Select Committee of the House of Lords, on Injury from Noxious Vapours, 1 August 1862. *BSP* 1862, XIV, p. 255.

This reform was not in fact effected, as the *Alkali Act*, 1863, applied only to chemical works. In 1866, however, smoke pollution provisions were written into the *Sanitary Act*, and in 1875 smoke provisions of a national scope were included in the 1875 *Public Health Act*. Section 91 of the latter Act listed several offences which "shall be deemed to be nuisances liable to be dealt with summarily in manner provided by this Act". One such offence was,

> … [a]ny fireplace or furnace which does not as far as practicable consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill factory dyehouse brewery bakehouse or gaswork, or in any manufacturing or trade process whatsoever; and any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance…[19]

These provisions applied to all of England, exclusive of the metropolitan area, the reason being that the *Metropolitan Smoke Abatement Act* remained in force. Therefore, the enactment of the 1875 *Public Health Act* constituted a victory in the sense that it at last imposed a general smoke law across England, except for London and its environs, which were subject to smoke legislation specific to that area. Although Ireland and Scotland were not included in the legislation, at least the whole of England was now subject to statutory smoke provisions in one way or another.[20]

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[18] Report from the Select Committee of the House of Lords, on Injury from Noxious Vapours, 1 August 1862. *BSP* 1862, XIV, p. 8.

[19] *Public Health Act*, 1875, 38 & 39 Vict., c. 55, s. 91. *The Law Reports. The Public General Statutes*, vol. X, p. 375.

The 1875 Public Health Act smoke pollution provisions: a closer examination

1. Legislative origins

The success of the 1875 *Public Health Act* as a statutory consolidation and clarification of several areas of public health is indisputable. However, with respect to smoke pollution provisions, its merits were much less unequivocal. It contained many similarities to the earlier smoke legislation discussed above, but also several significant differences. The Act retained a similar definition of industrial smoke, yet provided a different context for that definition embodying a notably different conception of pollution as a nuisance rather than a prohibited offence. This difference of approach to the problem of smoke pollution found in the 1875 Act stemmed partly from the fact that several types of legislation informed the creation of its smoke clauses.

1.1 Definition of industrial smoke

To begin with, the 1875 *Public Health Act* contained several important features found in the statutory smoke prohibitions of the early and mid-nineteenth century. First, its drafters created a broad definition of smoke that combined several variants of smoke prohibition clauses. In so doing, they adopted the wording of the definition of smoke that had gradually developed and become consolidated in earlier smoke prohibition legislation. By the 1840s, a significant level of consistency had developed with respect to the wording of the prohibitory smoke provisions in force. Although smoke consumption clauses were written into a variety of Acts of different kinds, they all isolated the offence of allowing industrial furnaces or chimneys to emit excessive amounts of smoke. Some identified furnaces, while others included chimneys, and all laid out automatically applicable fines in the event of a smoke offence. Ultimately, the *Public Health Act* of 1875 incorporated both of these offences, citing furnaces as well as chimneys as possible sources of smoke pollution.

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[20] Much of the worst industrial pollution was generated in Scotland, and separate study of the Scottish smoke law enacted in the nineteenth century would likely be highly valuable in the attempt to uncover the roots of modern smoke pollution law.

A brief comparison of several smoke prohibition clauses reveals the development of consistency in their wording. Two early local improvement Acts focused on penalising the owners of polluting furnaces. One of the earliest statutory smoke prohibitions can be found in the *Derby Improvement Act* of 1825, which stipulated that,

> … all furnaces employed or to be employed in the working of engines by steam, and all furnaces employed or to be employed in any mill, factory, brewery, bake-house, gas-works, or other buildings used for the purposes of trade or manufacture within the said borough (although a steam-engine be not used or employed therein) shall be constructed in the best manner known or practised so as to consume their own smoke…[21]

Eighteen years later, the *Leeds Improvement Act* included a very similar clause, the only difference being in the list of industries liable to prosecution under the Act. It required that,

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[21] 6 Geo. IV (1825), c. 132, s 65. cited in Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 337.

> … all furnaces employed or to be employed in the working of Engines by Steam, and all Furnaces employed or to be employed in any Mill, Factory, Dye-house, Brewery, Bakehouse, Gas Works, and other Buildings used for the Purposes of Trade or Manufacture within the said Borough (although a Steam Engine be not used or employed therein), shall, in all Cases where the same shall be practicable, be constructed so as to prevent or consume their own Smoke…[22]

These local Acts later proved inspirational to members of Parliament who sought to enact a new national smoke law in the 1840s. Their draft bills reveal the extent of the influence provided by the local Acts. The earliest ones did not contain the same wording, for example the bill of June, 1844, sought to regulate the actions of the owners of industrial premises rather than issuing declarations concerning the furnaces or chimneys themselves.[23] Yet these bills gradually assumed a construction bearing much closer resemblance to the local improvement Acts. The focus on industrial furnaces alone, without mention of their owners, was articulated in a smoke bill from 1845:

> … every furnace employed or to be employed in the working of engines by steam, and every furnace employed or to be employed in any mill or factory used for the purpose of manufacture (although a steam-engine be not used or employed therein), or the furnace of any steam-boat, shall, in all cases where the same shall be practicable, be constructed so as to consume or burn the smoke arising from such furnace …[24]

As noted earlier, several smoke prohibition clauses were inserted into other pieces of legislation while attempts were repeatedly made to enact a national smoke law between 1843 and 1853. Their wording reveals the growing standardisation of such clauses, as they contained the same emphasis on the offence of emitting smoke from furnaces, and followed the same practice of providing a list of polluting industries. The 1851 *London Sewers Act* declared that,

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[22] *Leeds Improvement Act, Local and Personal Acts*, 5 & 6 Vict. (1842), c. 104, s 249.

[23] The bill stipulated that, "… it shall not be lawful for the occupier of any Furnace or Chimney to permit opaque Smoke to issue from such Chimney between the hours of Six of the clock in the morning and Seven of the clock in the evening for any longer period than is hereinafter mentioned …" A Bill to prohibit the Nuisance of Smoke from Furnaces or Manufactories. 12 June 1844. BSP 1844, IV, pp. 558-559.

[24] A Bill To prohibit the Nuisance of Smoke from Furnaces or Manufactories. 5 March 1845. *BSP* 1845, VI, p. 44.

> Every furnace employed or to be employed in the working of engines by steam, and every furnace employed or to be employed in any mill, factory, printing house, dyehouse, iron foundry, glasshouse, distillery, brewhouse, bakehouse, gasworks, waterworks, or other buildings used for the purpose of trade or manufacture within the city (although a steam engine be not used or employed therein), shall in all cases be constructed or altered so as to consume the smoke arising from such furnace…[25]

The 1847 *Town Improvement Clauses Act* stipulated, almost identically, that,

> Every fire-place or furnace constructed after the passing of the special Act, in order to be used within the limits of such Act in the working of engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, gasworks, or in any manufactory whatsoever (although a steam-engine be not used or employed therein) shall be so constructed as to consume the smoke arising from the combustibles used in such fire-place or furnace …[26]

This section of the *Town Improvement Clauses Act* was adopted by the 1858 *Local Government Act*, but with several qualifications added.

These clauses culminated in 1853 with the passage of the *Metropolitan Smoke Abatement Act* :

> … every Furnace employed or to be employed in the Metropolis in the working of Engines by Steam, and every Furnace employed or to be employed in any Mill, Factory, Printing House, Dyehouse, Iron Foundry, Glasshouse, Distillery, Brewhouse, Sugar Refinery, Bakehouse, Gasworks, Waterworks, or other Buildings used for the Purpose of Trade or Manufacture within the Metropolis, (although a Steam Engine be not used or employed therein,) shall in all Cases be

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[25] *City of London Sewers Act*: 14 & 15 Vict., c. xci (1851), s. 48.

[26] *An Act for consolidated in One Act certain Provisions usually contained in Acts for paving, draining, cleansing, lighting, and improving Towns (Town Improvement Clauses Act),* 10 & 11 Vict. (1847), c.34, s 108, pp. (Pickering, pp. 400-401).

> constructed or altered so as to consume or burn the Smoke arising from such Furnace…[27]

Other smoke consumption clauses took a slightly different approach, and isolated industrial chimneys as the source of smoke pollution. The May 1845 smoke prohibition bill, for instance, stated that, "opaque Smoke shall not be permitted to issue from any Chimney of a Furnace for any longer period of time than is bonâ fide necessary for the kindling of the fire of such Furnace."[28] Both furnaces and chimneys were included in some cases, such as in the June 1844 smoke prohibition bill which declared that,

> … it shall not be lawful for the occupier of any Furnace or Chimney to permit opaque Smoke to issue from such Chimney between the hours of Six of the clock in the morning and Seven of the clock in the evening for any longer period than is hereinafter mentioned…[29]

The 1875 *Public Health Act* also included a definition of smoke pollution that incorporated both furnaces and chimneys. In this way, it broadened the definition of industrial smoke, as such a definition would have included the widest range of industrial buildings and processes. This feature was discussed long before the passage of the 1875 Act, and the goal of the broadening of the definition of smoke was recognised to be desirable through the use of such wording. This can be seen, for instance, in the testimony of Sir John Simon, Medical Officer of Health for London, before the legislators drafting the national smoke abatement bill of 1850. Simon was asked his opinion of the 1850 bill and he asserted that the goal of smoke eradication was "highly desirable", but he was worried that "the professed object appears likely to be attained in a very scanty measure, owing to the limited range of action proposed by the law." His first objection was that the Bill only targeted steam engine furnaces, when in fact "there must be many furnace chimneys, unconnected with steam engines, which evolve great volumes of smoke and are a great nuisance to their neighbourhood."[30] In this way, the 1875 *Public Health Act* built upon the experience provided by earlier legislative attempts when it expanded the legal boundaries of what constituted industrial smoke by naming both furnaces and chimneys.

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[27] *Metropolitan Smoke Abatement Act*, 16 & 17 Vict., c. 128 (1853), s. 1.

[28] [new title] An Act to abate the Nuisance of Smoke from certain Furnaces and Chimnies. 21 May 1845. *BSP* 1845, VI, p. 48.

[29] A Bill to prohibit the Nuisance of Smoke from Furnaces or Manufactories. 12 June 1844. BSP 1844, IV, pp. 558-559.

Overall, therefore, much consistency developed in the smoke prohibition clauses contained in a range of different Acts. The *Public Health Act* of 1875 incorporated a combination of all these provisions and was, overall, very broad in its definition of smoke. At the same time, however, the Act retained a problematic feature of the earlier smoke law with respect to the conception of industrial smoke articulated in it: that of emphasizing the "opaque" or "dark" quality of such smoke. An examination of the historical development of this emphasis on the visible aspect of smoke pollution reveals the problematic consequences that stemmed from it and would continue to plague smoke law for decades after the passage of the 1875 Act.

Ever since the ancient assize of nuisance, a fundamental aspect involved in the deeming of a nuisance as such was the fact of its being viewed or witnessed by a group of people, whether justices, a jury, or the public. Initially, an assize of nuisance involved a hearing before a number of justices. They would usually visit the scene of the alleged nuisance in order to see it for themselves in their efforts to deem it a nuisance.[31] This was still largely the case in the late eighteenth and early nineteenth centuries with respect to local nuisance indictments. Public nuisances were brought before justices of the peace or a jury, at which point evidence was considered. If there was sufficient evidence of a nuisance, the justices or jury issued an indictment. Indictments could be initiated by members of the public, if they presented evidence to the justices or jury, or by the local authorities themselves who could also bring forward evidence. All of these possible scenarios required extensive investigation of the alleged nuisances and involved extensive public participation, whether as initiators of actions, witnesses, or jury members.

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[30] *The Times*, Friday, July 5, 1850, p. 8, col F.

Similarly, in the 1820 minutes of evidence before the Select Committee on Steam Engines and Furnaces, repeated comments were made concerning "the public" judging the nuisance, smoke levels, and viewing smoke abatement equipment. Some Committee members traveled to see smoke abatement apparatuses in operation for themselves. Michael Angelo Taylor, the Committee Chair, for instance, reported on his visit to Josiah Parkes's worsted works in Warwick. He was so impressed by Parkes's success in abating his furnaces' smoke that he invited Parkes to travel to London to install his equipment in the premises of several industrialists of different kinds. His purpose was to provide an opportunity for the public to view the effectiveness of Parkes's equipment with their own eyes by being able to see the reduced amount of smoke: "… I desired Mr. Parkes to come to London, and apply in my name to persons who had steam-engines, and see if they would permit him to have their furnaces so altered, that the Public might judge whether or no his apparatus would give as fair a promise of success in

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[31] H. M. Chew and W. Kellaway, eds. *London Assize of Nuisance 1301-1431* (London, 1973).

London as it had done at Warwick."[32] Likewise, Kirkman Finlay, a member of the Committee and industrialist, visited, at the request of Michael Angelo Taylor, the Barclay brewery in London that was equipped with Josiah Parkes's smoke abatement technology and was very impressed by it. In fact, as a result of his visit to the brewery, he was "quite satisfied that if Mr. Parkes's improvement was generally adopted there it would remove every thing approaching to the shape of nuisance in that city."[33]

Other witnesses before the Committee emphasised the importance of public observation in determining whether a nuisance existed. In 1843, William Beckett from Leeds was asked whether "the nuisance arising from smoke may be abated altogether?" Beckett replied that, "The nuisance from smoke has already been to a considerable degree abated in Leeds; I cannot say that I believe it can be abated altogether, but it may be materially diminished."[34] When Beckett answered that there had been abatement, a Committee member asked him to explain what tests were used to determine this fact. Beckett explained that the decisive test was "the personal observation of people who are resident in Leeds" and that "the result of which is, that the nuisance is abated." So once again, Beckett drew upon the traditional manner of defining and dealing with nuisance, in which observation by the public was vital.

This traditional approach to nuisance law was fading by the 1840s, however, and, instead, members of Parliament involved in the smoke nuisance debate developed new ways of ascertaining nuisances. Prime Minister Robert Peel, for example, in replying to William Mackinnon's appeal for support for his smoke abatement bill, suggested recruiting men with factory experience to examine the various smoke abatement technologies in existence in the place of the Committee members. In July 1844, during a discussion of the 1844 bill in the House of Commons, Peel suggested that Mackinnon postpone the bill until the following year, when he might receive assistance from "all persons connected with the manufacturing districts" in order to avoid the lack of success with which the bill was met at the time of the discussion. He then added that "He understood that there were some forty or fifty inventions for abating this nuisance, and he hoped that men of practical experience would examine some of them."[35] The perceived need for the committee members to see these inventions themselves, something considered so critical in 1819 and 1820, was fading. This appears to have occurred in conjunction with the declining importance of the personal experiences of pollution that were also so prevalent in the testimony before the 1819 and 1820 parliamentary Committees. As discussed in the previous chapter, with the rise of attempts to pass national, statutory law of the type proposed in the 1840s, pollution and its control were becoming more abstract, general conceptions, divorced from the immediate intimate knowledge of committee members responsible for legislating smoke pollution law as well as from the immediacy of harm to the individual's property and comfort.

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[32] Report from the Select Committee on Steam Engines and Furnaces &c. 5 July 1820. *BSP* 1820, II, p. 244.

[33] Report from the Select Committee on Steam Engines and Furnaces &c. 5 July 1820. *BSP* 1820, II, p. 245.

[34] Report from the Select Committee on Smoke Prevention. 17 August 1843. *BSP* 1843, VII, p. 387.

However, although the importance placed on viewing nuisances to deem them nuisances declined, the importance of smoke being a visible substance persisted. Josiah Parkes, for instance, before the 1843 Select Committee on Smoke Prevention, continued to characterize indictable smoke as visible smoke. When explaining why the admission of air solely through the fire grate bars did not provide enough air to produce full combustion and thus prevent the creation of smoke, he mentioned carbon dioxide and carbon monoxide (both of which are invisible), but did not see them as constituting nuisances. Rather, he characterized their escape from chimneys (when they were simply allowed to escape through the chimney) as a loss of "heating matter". The easily visible soot ejected from the chimney, on the other hand, was what constituted the nuisance:

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[35] Hansard, *Parliamentary Debates*, vol. 76, 3 July 1844, col. 285.

> There is not enough of it [air let in through the furance grate bars] to combine with the carbon of the coal, and with the gases which are evolved and carried off at great velocity. The products of combustion pass off mixed with inflammable matter, and during its transit through the fuel much of the carbonic acid becomes converted into carbonic oxide, which also requires additional air, or oxygen from the air, for its conversion into flame. It is these gases, which demand a supply of air distinct from that which enters the furnace through the grate; otherwise they pass off unconsumed and useless as heating matter, together with their accompaniment, soot, which is the more particular and visible nuisance.[36]

This notion of smoke pollution as visible then became enshrined in subsequent legislation, despite some hints from witnesses that this was not necessarily the best definition of such pollution. Industrial experts Charles Wye Williams and Andrew Ure both testified before the 1843 Select Committee that the invisible components of smoke, in particular carbon monoxide, posed potentially far greater health risks than the dark, visible soot emitted from chimneys. The Committee failed to take these recommendations into account, however, and as the bills of the 1840s were repeatedly stalled due to disputes concerning the definition of "opaque" smoke, confusion and frustration arose am[illegible]he general public. In 1850, an editorial in *The Times*, commenting on the second reading of the smoke prohibition bill then before Parliament, urged that some resolution to the problem be found: "This measure is no longer one which can be cast aside upon the supposed difficulty of determining what is, and what is not, 'opaque smoke'."[37] A powerful letter to the same newspaper from a journeyman glasscutter living in crowded, working-class central London revealed the urgency of the problem and the somewhat ridiculous nature of the dispute about the definition of "opaque smoke" from the perspective of those suffering most severely from the effects of industrial smoke and other forms of pollution. He began with a detailed description of the filth created by industrial smoke:

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[36] Report from the Select Committee on Smoke Prevention, 17 August 1843. *BSP* 1843, VII, p. 562.

> In this district are a number of sugar refineries, chymical works, &c., which vomit forth immense clouds of unburnt fuel; our streets are covered with the heaviest parts of this condensed carbon, rolling about with every gust of wind like quantities of black peas; the fronts of the houses are begrimed with a sublimate of soot, and we breathe a highly carbonized atmosphere, having the smell and taste of half-burnt coal.

He then pointed out that the problems among legislators of defining the term "smoke" came from the legislators' never having experienced such an atmosphere, and ended with the following plea: "Sir, I would that those hon. gentlemen of the Commons, who could not define the term opaque smoke, were obliged to live in this neighbourhood during the recess; those who survived would have little difficulty in doing so when they return to their duties."[38]

These pleas were not acted upon, however, and all of the bills of the 1840s as well as the *Metropolitan Smoke Abatement Act*, 1853, and *Public Health Act*,

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[37] *The Times*, 26 June, 1850, p. 6, col D.
[38] *The Times*, 28 August, 1849, p. 7, col. D.

1875, contained definitions of smoke as "opaque" or "black" emissions.[39] This definition remained a problem well into the twentieth century. The author of a 1906 article in *The Lancet*, pointed out that although indictable smoke was defined as "black" in the *Public Health Act*, there could also be damaging smoke that was white, blue, or "not black, but of some less pronounced tint, as yellow or brown."[40] Moreover, it continues to exist in current British environmental law.[41] Although the 1875 Act attempted to include a definition of industrial smoke that was as inclusive as possible, it also enshrined a problematic conception of the harmful components of such smoke as only those that were clearly visible upon their emission from industrial premises.

1.2 Definition of pollution

Therefore, the 1875 *Public Health Act* contained a definition of industrial smoke nearly identical to that of earlier smoke prohibition legislation, close variants of which have persisted to the present day. By contrast, the manner in which smoke emission offences were defined and deemed to be pollution differed notably from earlier definitions. Industrial smoke pollution was no longer defined as a unique form of pollution requiring either legislation exclusively concerning it, as in the case of the 1853 *Metropolitan Smoke Abatement Act*, or at least a clause devoted exclusively to it, as in the local improvement Acts that contained smoke consumption clauses. Instead, under the 1875 Act, smoke offences were included in a list of activities that could be deemed nuisances if they became excessively harmful. Thus, despite the similarity of the conception of smoke articulated in the 1875 Act, it was placed in a new context, one in which the process of determining when such smoke was to be considered pollution differed markedly from earlier legislation. This new context vested the familiar conception of smoke with new meaning.

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[39] The bill of June, 1844, for instance, contained the following definition: the expression "opaque Smoke" shall mean Smoke not transparent at the point of exit from the chimney; the word "Furnace" shall mean only such Furnaces as are employed for the heating of steam-boilers, for the purposes of trade or manufacture…" *A Bill [as amended by the committee] To prohibit the Nuisance of Smoke from Furnaces or Manufactories.* 12 June 1844. BSP 1844, vol. IV, pp. 557-566.

[40] "Need Smoke be 'Black' to Constitute an Offence?" *The Lancet*, October 10, 1903, p. 1029.

[41] For example, see the *Clean Air Act*, 1993, c. 11, part 1, s. 1: "Dark smoke shall not be emitted from a chimney of any building, and if, on any day, dark smoke is so emitted, the occupier of the building shall be guilty of an offence."

Section 91 of the *Public Health Act* provided a list of nuisances containing seven categories. The first six categories were any premises, any "pool ditch gutter watercourse privy urinal cesspool drain or ashpit", any animals kept improperly, any "accumulation or deposit", any overcrowded house, or any "factory, workshop, or workplace … not kept in a cleanly state…"[42] Lastly was the category of industrial smoke emitted from fireplaces, furnaces, and chimneys. Thus, smoke pollution became one of seven industrial activities, rather than an offence of a unique character requiring legislation specific to it. In this way, the repeated attempts made since the passage of the 1821 *Smoke Prohibition Act* to isolate smoke pollution from other forms of industrial pollution and other types of nuisances and to create legislation aiming solely to eliminate such pollution were eschewed in 1875.

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[42] *Public Health Act*, 1875, 38 & 39 Vict., c. 55, s. 91, *The Law Reports. The Public General Statutes*, vol. X, p. 375.

One reason for this departure lies in the fact that in listing several categories of potential nuisances, the 1875 *Public Health Act* embodied an approach to nuisance found in nuisance removal legislation. The definition provided in the 1875 *Public Health Act* of pollution with respect to industrial smoke was not borrowed from existing smoke prohibition legislation, but rather from nuisance removal legislation. The definition of pollution embodied in mid-nineteenth-century nuisance removal law was significantly more conservative than that contained in the smoke prohibition clauses enacted in the same period. It was this conception of pollution, one defined in terms of nuisance removal law, that was taken up by public health advocates who fought to include industrial smoke provisions in broader public health legislation.

It is therefore necessary to examine the development of nuisance removal legislation in this period and developments in public health law more widely in order to ascertain the origins of the conception of pollution embodied in the 1875 Act. Nuisance provisions contained in local improvement Acts and several general *Nuisance Removal Acts* all provided lists of activities that could be deemed legal nuisances by relevant local authorities. The practice of listing categories of nuisances in statutory law long predated the national nuisance removal legislation of the mid-nineteenth century. In local Acts of the early nineteenth century, these lists could reach significant length. For example, one such Act from 1822 applying to a town in the county of Northumberland contained a nuisance prevention section nearly two pages in length, including such activities as obstructing roads, firing weapons in public, and selling produce inappropriately.[43]

The first general *Nuisance Removal Act* was enacted in 1846. It declared that any two medical practitioners could sign a form, upon the request of relevant local officials, declaring any of several activities to be a nuisance. Complaints could be of, "… the filthy and unwholesome Condition of any offensive or noxious Matter, Refuse, Dung, or Offal, or of the Existence of any foul or offensive Drain, Privy, or Cesspool…"[44] The *Nuisance Removal Act* of 1855 contained a very similar list of industrial activities that could be declared nuisances. A complaint could be laid before justices of the peace for,

> … any Candle House, Melting House, Melting Place, or Soap-house, or any Slaughter-house, or any Building or Place for boiling Offal or Blood, or for boiling, burning, or crushing Bones, or any Manufactory, Building, or Place used for any Trade, Business, Process, or Manufacture causing Effluvia…[45]

This practice of listing categories of activities that posed the potential to become legal nuisances was then adopted in the nuisance sections of public health legislation. This first occurred in the *Sanitary Act* of 1866, championed by Sir John Simon, Medical Officer of Health for London. Part II of the *Sanitary Act* was entitled, "Amendment of the Nuisances Removal Acts". Under it, a nuisance was stated to include overcrowded houses and factories and workshops "not kept in a cleanly State, nor ventilated in such a manner as to render harmless as far as practicable any Gases, Vapours, Dust, or other Impurities generated …" Following these two categories were the following:

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[43] *An Act for lighting, paving, cleansing, watching, and otherwise improving the town of Alnwick, in the County of Northumberland*, 3 Geo. IV, c. 28 (1822), s. 40.

[44] *Nuisance Removal and Contagious Diseases Prevention Act*, 9 & 10 Vict., c. 96 (1846), s. 1.

[45] *An Act to consolidate and Amend the Nuisances Removal and Diseases Prevention Acts*, 1848 and 1849, 18 & 19 Vict., c. 121 (1855), s. 28.

> [a]ny Fireplace or Furnace which does not as far as practicable consume the Smoke arising from the Combustible used in such Fireplace or Furnace, and is used within the District of a Nuisance Authority for working Engines by Steam, or in any Mill, Factory, Dyehouse, Brewery, Bakehouse, or Gaswork, or in any Manufactory or Trade Process whatsoever…

as well as "any Chimney (not being the Chimney of a private Dwelling House) sending forth Black Smoke in such Quantity as to be a Nuisance…"[46]

Therefore, in the *Sanitary Act*, a definition of smoke taken from the smoke prohibition provisions discussed earlier was inserted into a list of activities within a nuisance removal provision of a public health Act. This aspect of the *Nuisance Removal Acts* was then adopted by the drafters of the *Sanitary Act* in 1866 and reshaped to include industrial smoke pollution. This was thus the point at which industrial smoke pollution was formally rejoined to the traditional conception of nuisance and nuisance removal, and ceased to be a particular form of pollution legislated in a distinct way with its own Act. Smoke pollution was defined in this way in the 1875 *Public Health Act* and would remain so until well into the twentieth century, remaining in force today. The enactment of the *Sanitary Act* and, later, the *Public Health Act*, marked the abandonment of the legislative approach attempted throughout the 1840s and culminating in the 1853 *Metropolitan Smoke Abatement Act*.

An additional notable departure from the prohibitory smoke consumption clauses of the 1840s and 1850s found in the 1875 *Public Health Act* was its adoption of a more traditional conception of pollution as a series of activities that were in many cases fully legal, but that could become nuisances if they became excessive in its extent or effects. In the 1875 Act, action could be taken against "any chimney … sending forth black smoke in such a quantity as to be a nuisance…"[47] This requirement that the smoke be harmful or excessive enough that it could be declared a nuisance was not present in earlier smoke prohibition clauses. Instead, it comprised a second feature adopted from nuisance removal legislation. In the *Nuisance Removal Acts*, none of the activities listed in the nuisance sections were deemed prohibited offences. They could become punishable nuisances if they were undertaken in an unreasonable or harmful manner, and such a determination rested with local officials.

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[46] *Sanitary Act*, 1866, 29 & 30 Vict. c. 90, s. 19.

A key aspect of the 1875 *Public Health Act* section 91 categories of nuisances was the fact that within them, an activity had to be determined to be a punishable offence by relevant local authorities. The seven categories of nuisances outlined above were described as activities which, if they reached "such a state as to be a nuisance or injurious to health", were to be "deemed nuisances liable to be dealt with summarily". This meant that any of them could become a legal nuisance if conducted in a manner deemed by local courts to be excessive or injurious to health, but none of them was declared to be a nuisance, an offence or generally prohibited, as smoke had been under earlier smoke abatement legislation. To the contrary, the fact that several of the types of pollution described in the *Public Health Act* of 1875 were in many cases considered acceptable aspects of industrial activity was reinforced in a qualifying clause relating to accumulations and deposits that directly followed the list of nuisances:

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[47] *Public Health Act*, 1875, 38 & 39 Vict., c. 55, s. 91, *The Law Reports. The Public General Statutes*, vol. X, p. 375.

> … Provided that a penalty shall not be imposed on any person in respect of any accumulation or deposit necessary for the effectual carrying on any business or manufacture if it be proved to the satisfaction of the court that the accumulation or deposit has not been kept longer than is necessary for the purposes of the business or manufacture, and that the best available means have been taken for preventing injury thereby to the public health …[48]

A similarly positive endorsement of industrial smoke emission was then articulated when the Act ordered courts to dismiss smoke complaints if, "having regard to the nature of the manufacture or trade", all means available had been adopted to avoid polluting.[49]

In the 1855 *Nuisance Removal Act*, the list of industrial activities that could be actionable nuisances, quoted above, was followed by the requirement that they be "certified to the Local Authority by any Medical Officer, or any Two legally qualified Medical Practitioners, to be a Nuisance or injurious to the Health of the Inhabitants of the Neighbourhood…"[50] The 1866 *Sanitary Act* contained an identical requirement as the 1875 *Public Health Act* concerning the emission of smoke from chimneys. Therefore, once again, the *Sanitary Act* combined a legislative feature of nuisance removal law with smoke pollution provisions. This convergence compromised the rigid and objective conception of smoke pollution embodied in prohibitory smoke consumption clauses.

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[48] *Public Health Act*, 1875, s. 91.
[49] Ibid.
[50] *An Act to consolidate and Amend the Nuisances Removal and Diseases Prevention Acts*, 1848 and 1849, 18 & 19 Vict., c. 121 (1855), s. 28.

1.3 Enforcement Procedures

In addition to this new definition of smoke pollution as a potential nuisance, under the 1875 *Public Health Act*, if a nuisance was created the procedures for stopping it were very different from those found in the *Metropolitan Smoke Abatement Act*, *Local Government Act*, and other mandatory smoke consumption provisions. There were no statutory penalties laid out that automatically applied to offenders. By contrast, several steps were required in order for action to be taken. Community members were required to submit information concerning the creation of a nuisance to the relevant local authority, and such authority would then decide whether it was "satisfied of the existence of a nuisance." If satisfied, a notice would be served to the offender requesting him or her to abate the nuisance, and if the offender refused to do so, the matter would be sent before a justice of the peace who could summon the offender to appear at a summary court. Only at that time could penalties be imposed of up to five pounds along with the payment of legal costs. The goals of providing a clear, objective definition of smoke pollution and of imposing uniform, automatic penalties for the creation of such pollution had disappeared by this point. Instead, the smoke provisions of the 1875 Act were of a reactive, rather than a preventive or prohibitory, nature. This feature constituted a final notable point of similarity between this Act and earlier nuisance removal legislation.

Under the common law, a jury was required to determine whether an activity constituted a nuisance, based upon evidence of the nuisance presented before it. This crucial step in nuisance proceedings underscores the extent to which common law nuisance was a reactive form of legal action, one in which an activity could only be defined as an actionable offence, and thus as pollution, after it had been created by an offender and scrutinized by a jury. As outlined in chapter two, the 1821 *Smoke Prohibition Act* was innovative in several ways, in particular in its national application of rules seeking to curb industrial pollution and in its conferring of powers on common law judges to order polluters to alter their industrial machinery in order to avoid the creation of future nuisances. Its primary aim, however, was to encourage the existing common law system of pollution control, allowing for reactive action to be taken upon the creation of a nuisance.

Similarly, the *Nuisance Removal Acts* of the mid-nineteenth century provided statutory mechanisms to facilitate nuisance actions similar to such actions at common law. Under them, if the relevant local authorities decided that a nuisance had indeed been created, they were to lay a complaint before justices of the peace who would then issue a summons to the owner or occupier of the premises and order him or her to ensure the cessation of the nuisance or to pay the costs for having the nuisance removed by the complainants. As with common law nuisance, there was a necessary step of determination of the existence of a nuisance. This step was removed from the smoke prohibitions, but retained in the *Nuisance Removal Acts* and later in the *Sanitary Act* of 1866 and the 1875 *Public Health Act.* Thus, the 1846 and 1855 *Nuisance Removal Acts* required a similar exercise of deciding when activities that were often normal aspects of a community's daily activities ceased to be reasonable and legal activities and became legally actionable offences, one which formed such an integral aspect of common law nuisance proceedings.

The same exercise was present in the 1875 *Public Health Act*. Local sanitary authorities, newly created by the Act, were required to inspect their jurisdictions, "with a view to ascertain what nuisances exist calling for abatement under the powers of this Act…" Local authorities could also receive information from community members concerning possible nuisances, and could serve abatement notices if they were "satisfied of the existence of a nuisance". Once again, therefore, in this regard the smoke provisions of the 1875 *Public Health Act* more closely resembled the *Nuisance Removal Acts* than the smoke prohibition legislation enacted repeatedly in the early to mid-nineteenth century.

Thus, while at first glance it appears that the *Public Health Act* contained the same smoke clauses laid out in so many earlier pieces of smoke prohibition legislation, it in fact embodied a markedly different approach to defining smoke pollution. It did not contain a direct statutory smoke prohibition of the type found in the several local improvement Acts that included smoke consumption clauses, the smoke abatement bills of the 1840s, the 1847 *Town Improvement Clauses Act* and restated in the 1858 *Local Government Act* and 1853 *Metropolitan Smoke Abatement Act*. In discarding the smoke prohibition, a feature of smoke law considered crucial by the legislators of the 1840s and 1850s was lost. Overall, the approach taken in the *Public Health Act* was far more conservative than that of the mid-century and in many ways resembled the older common law regime more closely than the statutory smoke prohibition clauses of the various Acts noted above.

2. Growing contestation of key concepts

The conservative nature of the 1875 *Public Health Act* smoke provisions was heightened by the fact that over the nineteenth century, several crucial concepts relating to both statutory and common law smoke law were contested and, ultimately, reinterpreted in a manner favourable to industry and industrial property owners. As a result, some apparent similarities to older smoke prohibition legislation in fact were marked by far-reaching changes of interpretation and meaning. The "best practicable means" test, the notion of "reasonableness" with respect to the nature and extent of industrial activity, and the perceived responsibilities of industrial owners and workers all underwent such reinterpretation in this period. Their evolution will be examined in this section.

2.1 The evolution of the "best practicable means" clause

As discussed in chapter three, the "best practicable means" clause originally appeared in statutory form in local improvement Acts, and was later included in legislation of more general applicability. It was originally designed to be a proactive test, requiring industrialists to equip their premises with the most up to date smoke abatement technology. This formation remained in use until the second half of the nineteenth century, at which time it evolved into a defensive clause offering protection to industrial polluters.

The earliest national smoke prohibition bills of the 1840s contained a "best practicable means" test that closely resembled the proactive articulation of it contained in the local improvement Acts. A brief examination of the unsuccessful smoke abatement bills of 1844 and 1845 emphasises these points concerning the status and purpose of the early articulations of the "best practicable means" clause. The June 1844 bill was the first proposed central legislation to contain a clause resembling "best practicable means". It provided that,

> … it shall be lawful for any Justice in all cases when any person shall be convicted before him of any offence under this Act, to mitigate the penalty payable in such case to One-half or any less proportion thereof, if such Justice shall, considering all the circumstances of the case, think it right so to do.[51]

Here the justices were empowered to consider all the facts and circumstances surrounding each case, and they could thus reduce penalties if they felt, for instance, that an offender had made all possible attempts to avoid emitting smoke pollution.

In the March 1845 bill, this clause was removed, but a schedule attached to the end of the bill which was to act as a guide for prosecutors contained a smoke prohibition clause worded almost identically to that found in the Derby, Leeds, and Salford improvement Acts. It required that all furnaces used to power steam engines or for any other manufacturing process or to power a steam-boat be able to consume their own smoke, and anyone caught using a furnace without smoke abatement technology or negligently using a furnace with such technology, "without using the best practical means for preventing or counteracting such annoyance" was subject to a weekly forty-shilling fine. Therefore, in the March 1845 bill the "circumstances" that justices were to consider in the earlier bill were laid out more explicitly through the inclusion of the "best practicable means" clause.

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[51] A Bill to prohibit the Nuisance of Smoke from Furnaces or Manufactories, 12 June 1844, *BSP* 1844, IV, p. 561.

The proactive nature of the "best practicable means" requirement appears to have been widely understood beyond the realm of Parliament. Descriptions of it as a burden to be met by polluters emphasise that in its early forms it was not perceived as an defence against prosecution for smoke pollution. To give just one example from the mid-1840s, the author of a letter to the editor of *The Times* complained of being virtually choked by smoke. As a solution to the problem, he urged that industrialists be required to meet the "best practicable means" test: "surely they ought, in justice to the public, to try all means in their power to abate the nuisance, by using some plan to consume the smoke, or by burning fuel which is smokeless."[52]

Similarly proactive "best practicable means" clauses were included in several successful pieces of legislation. The 1851 *London Sewers Act* stipulated that,

> … if any person shall … use any such furnace or shall so negligently use any such furnace as that the smoke arising therefrom shall be effectually consumed or burnt, or shall carry on any trade or business which shall occasion any noxious or offensive effluvia, or otherwise annoy the neighbourhood or inhabitants, without using, to the satisfaction of the commissioners, the best practicable means for preventing or counteracting such annoyance, every person so offending shall forfeit and pay a sum of not more than five pounds nor less than forty shillings, for and in respect of every day during which or any part of which such furnace or annoyance shall be so used or continued.[53]

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[52] *The Times*, 18 September, 1849, p. 6, col. C.
[53] *City of London Sewers Act*, 14 & 15 Vict., c. 91 (1851), s. 48.

In this clause, the use of the best means available were to be demonstrated to, and determined by, the London commissioners of sewers. Thus, there was a mechanism by which the "best practicable means" test was to be administered built into the provision.

It was only as things became increasingly complicated, once smoke abatement legislation declined in success and smoke abatement clauses were inserted into various other pieces of legislation, that this original logic was lost. The 1846 report by de la Beche and Playfair on the smoke problem mentioned that the weak wording of the local Acts had led to people interpreting them to mean that "the complainant is obliged to prove the practicability of consuming the smoke, proof of which may be impossible in the present state of the law, when even officers authorized by Government cannot enter and inspect premises, if objected to by the owners." The authors recommended more strongly worded smoke abatement clauses in which the burden of proof should be explicitly placed on the offender, "who ought to show that he has adopted the best known means for preventing the nuisance, or, in absence of such proof, incur the penalty."[54] This suggests that the transformation of the "best practicable means" clause from its initial purpose into an easy defence for industrial polluters was aided by the excessively vague wording in the earliest statutory smoke abatement provisions containing the clause.

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[54] Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 335.

The advice of de la Beche and Playfair was not taken, however, and the 1853 *Metropolitan Smoke Abatement Act* contained "best practicable means" provisions notably different from those described above:

> Provided always, that the words "consume or burn the smoke" shall not be held in all cases to mean "consume or burn all the smoke," and that the Justice or Justices before whom any person shall be summoned may remit the penalties enacted by this Act if he or they shall be of opinion that such person has so constructed or altered his furnace as to consume or burn as far as possible all the smoke arising from such furnace, and has carefully attended the same, and consumed or burned as far as possible the smoke arising from such furnace."[55]

Not only did legislators fail to strengthen the wording of the clause in this instance; they also removed the requirement that the polluter satisfy the local officials that they were using the best practicable means available to avoid polluting. Although this change was subtle, it amounted to a shift in the "best practicable means" clause, from comprising part of the requirements contained in the smoke prohibition clause itself (as can be seen in the *London Sewers Act* of 1851) to constituting a possible defence listed after the smoke clause in a separate section altogether. In this way, the proactive nature of the "best practicable means" as a test to be met by polluters was significantly eroded.

The 1858 *Local Government Act* took a similar approach, but with increasingly confusing wording:

> … and any Justice or Justices before whom any Person shall be summoned may remit the Penalty in any Case within such District in which he or they shall be of opinion that such Person has adopted the best known Means for preventing any Nuisance from Smoke, and has carefully attended to the same, so as to consume as far as possible the Smoke arising from any Process so exempted during such Time as any such Resolution shall extend to, unless an Order shall be issued by One of Her Majesty's Principal Secretaries of State directing that such

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[55] *Metropolitan Smoke Abatement Act*, 16 & 17 Vict. (1853), c. 128, s. 3.

> Exemption shall no longer be continued in such District to such Processes or any of them, after a Time specified in such Order.[56]

The new wording of the "best practicable means" clause included in the 1853 and 1858 Acts was also inserted into some local Acts in the early 1850s. Additionally, the clause fell victim to attempts to interpret it conservatively, adding to it implications concerning the rights of industrialists to operate polluting machinery in order to carry on their businesses. A case appealed in 1851 reveals this development. In 1851, a *Birmingham Improvement Act* was enacted, which contained the 108th section of the *Towns Improvement Clauses Act* with the added stipulation that, "the words 'consume the smoke' … shall not in all cases mean 'consume all the smoke' …" The appellant, a brass and copper wire manufacturer called Cooper, was initially charged by Woolley and convicted by a Birmingham magistrate of having used his furnace negligently. This was because it was equipped with a smoke consumption apparatus but Cooper had nonetheless allowed excessive amounts of smoke to be created on his premises. Cooper argued that he had not used his furnace negligently; rather, he claimed to have "consumed *as far as possible, consistently with the due carrying on of his trade* (which he contended to be the true intent and meaning of the act), the smoke arising from his furnace."[57] The Barons of the Exchequer were divided, with some supporting the appellant while others argued that, "the act could not be intended to allow the manufacturer to comply with its provisions just so far only as he found it consistent with the profitable working of his trade."[58] However, they found in the appellant's favour. They pointed out that the *Towns Improvement Clauses Act* itself would not have supported the appellant's argument, but that the insertion of the "best practicable means" in the form found in the 1851 *Birmingham Improvement Act* made his claim valid. Baron Pigott explained the relationship between the two Acts in the following way:

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[56] *An Act to amend the Public Health Act, 1848, and to make further Provision for the Local Government of Towns and populous Districts* (Local Government Act), 21 & 22 Vict. , c. 98, s 45. (Pickering, pp. 506-507). Also cited on p. 254 of the 1862 report.

[57] *Cooper v. Woolley* [1867], *Law Journal* (1867), *Reports*, New Series, vol. 36, p. 28.

> Taking the two acts together, it is clear that the fireplace must be constructed so as to consume its own smoke; that is the first thing. Then the manufacturer must carefully use it, so that in fact it does consume its own smoke when in operation. Then comes the second act [*Birmingham Improvement Act*], which says … that where the furnace is so constructed as to consume as far as possible all the smoke, and has been carefully attended to with a view to accomplish that object, in that case the Magistrate may remit the penalty…

Piggott then summarized the Court's decision, emphasizing the importance attributed by the Barons to Cooper's right to operate his factory:

> The question here is, was there any negligence in the use [of his furnace]? Of course, that implies that the furnace may be used for the purpose of properly carrying on the business… It is clear there is no negligence. It is clear that there was no other mode of using this fire-place to carry on the business than that which was adopted by the appellant, and that if he adopted the mode suggested by the respondent the business would be put a stop to altogether. I do not think that was the intention of the act.[59]

The Barons' emphasis on the rights of factory owners to operate polluting machinery in the face of legislation against such usage can also be found in the smoke provisions of the 1866 *Sanitary Act* and the 1875 *Public Health Act*. The *Sanitary Act* empowered justices to draw upon a "best practicable means" defence in order to find a defendant not guilty, rather than simply using it in his decision to mitigate the penalties attached to the smoke offence in question. It stipulated that,

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[58] *Cooper v. Woolley*, pp. 28-29.
[59] *Cooper v. Woolley*, p. 30.

> Secondly, that where a Person is summoned before the Justices in respect of a Nuisance arising from a Fireplace or Furnace which does not consume the Smoke arising from the Combustible used in such Fireplace or Furnace, the Justices may hold that no Nuisance is created within the Meaning of this Act, and dismiss the Complaint, if they are satisfied that such Fireplace or Furnace is constructed in such Manner as to consume as far as practicable, having regard to the Nature of the Manufacture or Trade, all Smoke arising therefrom, and that such Fireplace or Furnace has been carefully attended to by the Person having the Charge thereof.[60]

It was thus in this Act that the "best practicable means" was formally transformed, from a requirement burdening polluters to demonstrate their attempts to use all means known to exist to avoid allowing smoke pollution to be created by them, into a possible defence by means of which polluters could avoid conviction altogether. An almost identical construction was included in the 1875 *Public Health Act*, in a section immediately following the list of seven categories of nuisances.[61]

This change of wording in the Acts of 1866 and 1875 is all the more striking if one considers that in 1862, another plea to fix the "best practicable means" clause was made by a parliamentary Committee. In that year, the Committee on Noxious Vapours made various recommendations, including consolidating and rendering universally applicable the various existing laws concerning the emission of smoke and other industrial vapours and "effluvia", giving inspectors free access to industrial premises, and restricting appeals to higher courts "to cases in which the magistrate should certify that they involved question of law fitting to be there heard and decided." Once that was achieved, they felt that it would be possible to return to a system in which, "the magistrates may be safely entrusted with the discretionary power involved in the terms, 'the best practicable means for counteracting the annoyance'."[62] These recommendations indicate that the Committee members understood the importance of a clause such as the "best practicable means" in the context of strict laws imposing universal regulations with no loose wording and easy loopholes and conferring significant powers of enforcement on the relevant authorities. However, their recommendations were not taken up by legislators, so that the "best practicable means" continued its metamorphosis into the defensive construction that continues to plague existing smoke pollution legislation.[63]

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[60] *Sanitary Act*, 29 & 30 Vict. (1866), c. 90, s. 19.

[61] The only difference was that in the *Public Health Act*, a court of summary jurisdiction (a newly created form of court) was empowered to make the required decisions concerning the best practicable means, rather than justices of the peace.

2.2 Changing notions of "reasonableness"

Considerations of the "best practicable means" were centred on the appropriateness of the precautions taken by industrialists in pursuing their manufacturing activities. The 1875 *Public Health Act* included a further stipulation that courts had to take into consideration "the nature of the manufacture or trade" when deciding whether to convict alleged offenders. This requirement alluded to the wider question of the appropriateness or reasonableness of the manner and location in which industrialists chose to undertake their manufacturing activities. As short and as vague as it appears, this clause in fact reflected far-reaching changes of perception with respect to the question of the reasonableness of industrial pursuits. Such perceptions evolved in much the same way as the "best practicable means" test, and ultimately came to be understood in a similarly defensive manner. Industrialists began to successfully argue that if they undertook a polluting industrial activity in an appropriate location and taking all possible precautions, they should not be prosecuted for a pollution offence. Their claims were successful first in case law in the mid-nineteenth century, and were later articulated in the statutory law, culminating in the 1875 *Public Health Act* smoke provisions. The success of their arguments reflected several systemic changes affecting the geography and scope of industry in this period.

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[62] Report from the Select Committee of the House of Lords, on Injury from Noxious Vapours. 1 August 1862. *BSP* 1862, XIV, pp. 8-9.

[63] Today, the "best practicable means" clause plays an important role in two key pieces of British environmental legislation: the *Environmental Protection Act*, 1990, and the *Clean Air Act*, 1993.

By the second half of the nineteenth century, established norms concerning acceptable levels of industrial pollution and the proximity of polluting factories to other types of buildings were upset as the geographical location of industries changed. As will be seen below, several commentators involved in the smoke debate noted and discussed these changes and their connections to changing legal realities in terms of smoke pollution control. Changing patterns of location of polluting factories, wealthy residential areas and poorer neighbourhoods combined to create a climate in which attitudes toward industrial pollution changed markedly. These changes are discussed by many historians of the industrial revolution period, who examine the profound social dislocation that accompanied industrialization.[64] The following section will examine those changes specifically in terms of their consequences for perceptions of industrial pollution and the development of pollution law.

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[64] The effects of these geographical changes in the industrial revolution period are very effectively summed up by Richard Tames who concludes that, "[g]reater physical distance implied greater social distance." R. Tames, *Economy and Society in Nineteenth-Century Britain* (London: 1972), p. 140. See also K. Warren, *The Geography of British Heavy Industry since 1800* (London, 1976).

In the early nineteenth century, factory owners tended to be closely involved in the daily operations of their factories. A number of the industrialists who testified before the 1819 and 1820 Select Committees on Steam Engines and Furnaces mentioned the fact that their industrial premises were very close to their homes, and the discussions of their attempts to conserve fuel and prevent excessive smoke emissions revealed that they had detailed knowledge of the machines they owned.

As industrialization progressed, however, wealthy residents began to move away from polluting industrial premises, often leaving the areas closest to smoky factories almost exclusively inhabited by the working poor. As early as the 1840s, the prevalence of working-class neighbourhoods in close proximity to heavy industrial areas and the negative consequences of this development were commented on. In 1845, medical expert James Smith, in discussing the living conditions prevalent in the area of Leeds bordering a watercourse called the Addle Beck, noted that,

> [t]he lower classes here, as elsewhere, inhabit the less comfortable and less healthy localities along both sides of the Addle Beck …A number of dwellings, which, from the damp and pestilent effluvia arising from the decaying matter in the bottom of the Beck, combined with the smoke and fumes arising from the various works, are most unhealthy.[65]

The 1846 Report on the smoke problem commissioned by Parliament noted that the working poor were more willing to live amongst unprecedented levels of pollution, at least in part because they often depended upon the polluting factories for employment:

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[65] Report by James Smith (1845), cited from E. R. Pike, *Human Documents of the Industrial Revolution in Britain* (London, 1973), p. 323.

> The persons immediately subject to the nuisance of a smoky factory, for example, are in many cases dependent upon that factory for employment, or they are of a class which does not perceive any great prejudice to itself from the circumstance. These persons have been so long accustomed to its effects, that they have, by habit, become reconciled to that which might, at first, have been considered a nuisance, and they do not perceive the ultimate moral injury arising from want of cleanliness.[66]

As a result, the problem of smoke pollution came to be perceived increasingly in class terms. In 1853, Lord Palmerston, speaking in favour of the 1853 smoke abatement bill before the House of Commons, appealed to the House not to "back those smoke-producing monopolists" (i.e. factory owners opposed to the bill), whom he criticised for having,

> … wished to make 2,000,000 of their fellow inhabitants swallow the smoke which they could not themselves consume, and who thereby helped to deface all our architectural monuments, and to impose the greatest inconvenience and injury upon the lower class.[67]

The dangers of abandoning whole neighbourhoods to the working classes were warned of in a pamphlet from 1850 decrying the migration of Manchester's elites to the suburbs. The author criticised the rich, arguing that,

> … in thus leaving the industrial population to themselves, to struggle on in their own way, deprived of those friendly, benevolent attentions and services which the poor expect from their superiors in station—you are, perhaps, leaving the post of duty; a post which, according to the moral government of the world, is seldom deserted with impunity …[68]

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[66] Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 334.

[67] Hansard, *Par'l. Deb.*, Aug. 9, 1853, vol. 129, col. 1496.

[68] (anonymous). *On the Climate of Manchester: and the Social Evils Produced by Neglecting to Tile Drain the Land in the Suburban Township*. Read at a Meeting of the Manchester Statistical Society, January 24th, 1850 (Manchester, 1850).

The same problems were discussed before the 1862 Select Committee on Noxious Vapours. A Lancashire surveyor and civil engineer, Thomas Stattler, described the long-term consequences of atmospheric pollution in his county before this Committee. In Lancashire, there were so many polluting spinning, bleaching, dyeing, and chemical production enterprises that Stattler feared the entire area would be decimated: "There are many districts in which we shall not have a tree left in the course of a few years unless something be done to stay the destruction which is ensuing."[69] A particularly bad firm was that of chemical manufacturer Joseph Muspratt of Liverpool, who was forced to close his factories after a protracted legal battle ending in 1840. Stattler explained how the pollution from Muspratt's factory forced widespread change in the make-up of the neighbourhood around it. His works,

> …destroyed the vegetation; the more respectable inhabitants left the district; the property was very much deteriorated, and at the present moment most of the good residences are being pulled down, and streets of small houses are being built upon the land.[70]

When the Committee members pointed out that Muspratt had left the Liverpool area more than twenty years earlier and questioned the link drawn by Stattler between Muspratt and the ongoing demographic changes he had witnessed, Stattler emphasized the long-term nature of the changes initiated by the pollution problems:

> The effect was produced originally by the works themselves; the respectable people left the neighbourhood; the houses were let at half the money they had been previously let at, and they have never returned into the district at all … the great difficulty is, when once people have

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[69] Report from the Select Committee on Noxious Vapours, *BSP* 1862, XIV, p. 130.
[70] Report from the Select Committee on Noxious Vapours, *BSP* 1862, XIV, p. 132.

> left a district, to bring them back again; there is a residential prejudice created against the district.[71]

Another witness interviewed by the same Committee described the negative consequences of the type of demographic change described by Stattler. Michael Angelo Garvey, a barrister from Camden, described Belle Isle, an area of approximately nine acres in central London that contained "a number of manufactories of various kinds, all of the most offensive description".[72] Garvey expressed pessimism when asked if he thought a central inspectorate would help curb the pollution levels in Belle Isle because he felt that few of the neighbourhood's predominantly working-class inhabitants would be in a position to call upon such an inspectorate. As he noted,

> …unfortunately it happens that the persons who are most annoyed by these nuisances are persons who have very little influence with the local authorities, and who take no part in the administration of the local affairs…[73]

A further problem that had become apparent by this time was the concentration of polluting factories in particular areas. Numerous witnesses described areas that contained several factories of different kinds, all of which emitted atmospheric pollution. Their proximity to each other made it increasingly difficult to pinpoint the source of smoke emissions. Michael Angelo Garvey noted that legal action was successfully undertaken again a

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[71] Report from the Select Committee on Noxious Vapours, *BSP* 1862, XIV, p. 133.

[72] These included nine varnish makers, several "stuff makers" (firms that melted animal parts, usually "in a state of putrefaction", to extract the fats), three tallow-melters, two soap-boilers, two manure manufacturers, two black japan varnish manufacturers, pig keepers, one match maker, one ink maker, along with several other firms.

[73] Report from the Select Committee on Noxious Vapours, *BSP* 1862, XIV, p. 209.

"blood-manure" manufacturer, in whose factory animal blood was mixed with sulphuric acid to produce "dreadful" vapours. This was an isolated case, however, due to the fact that such action was very difficult to undertake when so many polluting factories operated in such close proximity to one another. Garvey asserted that the biggest barrier to successful prosecutions was the problem of linking a particular flow of pollution to a specific source, or, "[t]he difficulty of selecting any one of those effluvia and tracing it to its source, so as to bring it home to the manufacturer by legal evidence. We have been always defeated on that point."[74] Furthermore, several factory owners abided by the 1853 *Metropolitan Smoke Abatement Act* by installing smoke consumption equipment in their furnaces, but did not use the equipment properly. Here again, successful legal action was next to impossible.

At the same time that the changing geography of industry made successful legal action against industrial polluters increasingly difficult, the changing conceptions, described above, of what constituted "reasonable" methods and locations with respect to industrial pursuits were articulated in several nuisance cases adjudicated in this period. These new conceptions then informed the creation of the smoke pollution provisions of the 1875 *Public Health Act*.[75]

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[74] Report from the Select Committee on Noxious Vapours, *BSP* 1862, XIV, p. 207.

[75] An extensive debate exists among legal historians concerning the nature of common law developments with respect to environmental protection in this period. Joel Brenner and Morton Horowitz argue that from the early nineteenth century, British and American tort law was deliberately manipulated by common law judges in order to favour industries and entrepreneurs. See J. F. Brenner, "Nuisance Law and the Industrial Revolution", *Journal of Legal Studies* vol. 3, no. 2 (June 1974), pp. 403-433. M. J. Horowitz, *The Transformation of American Law, 1780-1860* (Cambridge, Massachusetts, 1977). In agreement with Horowitz and Brenner on the role played by judges in the nineteenth century are most members of the American "critical legal studies" school,

For example, the problem of where industry could be safely located was very old, but solutions to it changed greatly over the nineteenth century. The evolution of the conception of what constituted an appropriate location for a polluting firm can be traced through several renowned cases adjudicated between the late seventeenth and mid-nineteenth centuries. In the late seventeenth and eighteenth centuries, common law nuisance actions contained a clearly defined notion that the choice of an inappropriate location for a polluting factory or other industrial activity could result in a successful nuisance action. In *Aldred's Case*, a nuisance suit from 1610, the defendant, Thomas Benton, was sued for building a pigsty very near the property of his neighbour, William Aldred.[76] The defendant was initially found guilty at the Norfolk assizes. Benton then appealed to the Court of King's Bench where he argued that "the building of the house for hogs was necessary for the sustenance of man, and one ought not to have so delicate a nose that he could not bear the smell of hogs …"[77] He lost the appeal because the judges deemed

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for example: R. Posner, *The Economic Analysis of Law* (Boston, Little and Brown, 4th ed. 1992); D. R. Coquillette, "Mosses From an Old Manse: Another Look at Some Historic Property Cases About the Environment", *Cornell Law Review* vol. 64, no. 5 (June 1979), pp. 761-821. Among those opposed to the Horowitz thesis, see M. S. McBride, "Critical Legal History and Private Actions Against Public Nuisances, 1800-1865", *Columbia Journal of Law and Social Problems* vol. 22, no. 1 (1988), pp. 307-322 and P. Karsten, *Heart versus Head: Judge-Made Law in Nineteenth Century America* (Chapel Hill and London, 1997); R. Epstein, "The Social Consequences of Common Law Rules", *Harvard Law Review* vol. 95, no. 8 (June 1982), pp. 1717-1751. The present discussion will focus narrowly on the link between several prominent nuisance cases and developments in the statute law of the later nineteenth century, drawing on suggestions from some historians taking a different view from those cited above. For example, see J. P. S. McLaren, "Nuisance Law and the Industrial Revolution – Some Lessons from Social History", *Oxford Journal of Legal Studies* vol. 3, no. 2 (1983), pp. 155-221; C. Rosen, "Differing Perceptions of the Value of Pollution Abatement, 1840-1906" *Law and History Review* 11 (1993); D. M. *Provine*, "Balancing Pollution and Property Rights: a Comparison of the Deveopment of English and American Nuisance Law", *Anglo-American Law Review* 7 (1978).

[76] *Aldred's Case* [1610], 77 *English Reports*, p. 816.

[77] *Aldred's Case*, p. 816.

that, despite the fact that building a pig-sty was a legal and necessary activity, he had built the pig-sty in such a way that it was unnecessarily damaging to Aldred's property by being too near to Aldred's house. The judges also offered several other cases which they considered analogous. One case concerned the building of a lime-kiln, another "good and profitable" activity. However, as the judges reasoned, "if it be built so near a house that when it burns the smoke thereof enters into the house, so that none can dwell there, an action lies for it."[78] Similarly, a glover who set up his industrial premises too near a watercourse on the plaintiff's property "running in a ditch from the river to his house, for his necessary use".[79]

A case from 1683, *Rex v Pierce*, involved very similar issues, but was a prosecution for a public nuisance rather than private nuisance. It also involved an industrial activity, in this case soap boiling. The judges ruled that, "[t]he trades of soapboiling, calendaring, and brewing, though lawful, yet if carried on to the annoyance of the neighbourhood, are nuisances."[80] Therefore the criterion of a legal trade becoming a nuisance if it was practised in an inappropriate location was the same as that articulated in *Aldred's Case*. However, in *Rex v Pierce* it was not necessary to show that the defendant's soap boiling activities had caused damage to the property of neighbourhood, because public nuisance cases did not have the same landownership requirement as private nuisance cases.

Thus, in both public and private nuisance actions, it was a well established feature of nuisance law that an inappropriate location was a basis for legal action.

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[78] *Aldred's Case*, p. 816.
[79] *Aldred's Case*, p. 816.
[80] *Rex v. Pierce*, [1683], 89 *English Reports*, p. 967.

Once the lawsuits were undertaken, juries or judges decided when industrial activities, that were in normal circumstances legal and considered worthwhile, profitable endeavours, became legal nuisances.

In the eighteenth century, several of the well established notions and practices found in earlier nuisance cases were challenged. In 1757, a case involving the well-known Twickenham sulphuric acid manufacturer Josiah Ward suggests that perceptions regarding established nuisance law were gradually changing. Ward and his business partner, White, were indicted and convicted of creating a public nuisance for having built a sulphuric acid plant too close to a public highway and several houses. As the indictment laid out,

> … the defendants erected twenty buildings for making noisome, stinking and offensive liquors; and then and there made fires of sea-coal and other things, which sent forth abundance of noisome, offensive and stinking smoke; and made … great quantities of noisome, offensive, stinking liquors … whereby … the air was impregnated with noisome and offensive stinks and smells…[81]

The indictment was very similar to the form of the indictment issued in *Rex v. Pierce*, and which continued to be used well into the nineteenth century. It charged that the defendants built their works "at the parish of Twickenham… near the King's common highway there, and near the dwelling-houses of several of the inhabitants…"[82] Ward and his partner White appealed their conviction, and argued that the indictment was worded in an overly vague manner. They objected that, among several other things, the location indicated was not precise enough, and "…only said 'near the common highway' but not said to be in the town or village:

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[81] *Rex v. White and Ward* [1757], 97 *English Reports*, p. 338.
[82] *Rex v. White and Ward*, pp. 338-341.

it may be upon a heath or common for aught that appears to the contrary."[83] The Court rejected their arguments, however, and upheld the original verdict against the industrialists. Lord Mansfield explained that the question of the appropriateness of the location of a factory was a matter for the jury to decide, and the judges would not overturn the decision of the jury in this case: "The very existence of the nuisance depends upon the number of houses and concourse of people: and this is a matter of fact, to be judged of by the jury… Therefore there is no foundation for the objections."[84]

Therefore, the judges saw the case in much the same terms as *Aldred's Case* and *Rex v Pierce*. Despite the similarity of the judges' decision in *Rex v White and Ward* to those in *Aldred's Case* and *Rex v Pierce*, the questions raised the Ward and White's lawyers concerning what constituted a legal nuisance arose repeatedly as new industrial processes became the subjects of legal actions. As industrial activity came to be increasingly considered vital to the country's economy, the question of the public benefit deriving from industrial works became a more common consideration in the case law. As a result, the question of what or who had to be damaged in nuisance cases became increasingly complicated. An illustrative case is that of *Rex v Davey* from 1805. This was a case following an indictment for a public nuisance. The defendant was accused of building several industrial furnaces, and the prosecutors successfully proved that the furnaces,

> …did throw out great quantities of smoke, the sulphureous smell of which was very offensive to the inhabitants of the adjoining houses;

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[83] *Rex v. White and Ward*, pp. 334-335.
[84] *Rex v. White and Ward*, p. 337.

> that the furniture was spoiled; and that flakes of fire often came from the flue of the furnace, which might have been attended with danger.[85]

However, the judge counselled the jury that this was not a public nuisance. This was because in order to be deemed a public nuisance, it had to be shown that, "… the grievance was either destructive to the general health of the inhabitants, or rendered their dwelling uncomfortable or untenantable."[86] The prosecutors presented a witness whose health was alleged to have suffered due to the smoke pollution. However, the judge argued that the health of just one person was not enough to deem an activity a public nuisance. As he explained, "… the jury were not to consider the delicate health of any individual as constituting a public nuisance, as some persons could not enjoy their healths in the neighbourhood of a city."[87] Similarly, the judge argued that when the neighbouring inhabitants kept their windows shut, the smoke "did not affect the houses", and the sparks coming from the defendant's chimney "appeared to extend but a little way", none of which amounted to a public nuisance.[88] Accordingly, the defendant was acquitted. The amount of suffering and discomfort that the prosecution had successfully proven appears to have been at least as large as that described in *Rex v. White*, yet the judge rejected it because the parameters he laid out—those of harmfulness to health or to property values—were not met. Neither these stricter criteria nor the judge's counseling of the jury are visible in the earlier cases, and they appear to reflect the expansion of the boundaries of what might be considered appropriate usage of one's property.

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[85] *Rex v. Davey and Another* [1805], 170 *English Reports*, p. 791.
[86] *Rex v. Davey and Another*, p. 791.
[87] *Rex v. Davey and Another*, p. 791.
[88] *Rex v. Davey and Another*, p. 791.

The weighing of the public benefits and private losses sustained by those living in close proximity to polluting industries remained contentious into the mid-nineteenth century. In a case from 1858, *Hole v. Barlow*, a landowner was sued for manufacturing bricks on his property too near the plaintiff's house. The judge directed the jury to find in favour of the defendant, because, he argued, if the plaintiff won, the defendant would likely have to cease his operations altogether and the public would be unnecessarily harmed by the cessation of those operations. The appellate judges upheld the original verdict, one of whom summed up the clash of the rights of the public versus those of private landowners:

> The common-law right which every proprietor of a dwelling-house has to have the air uncontaminated and unpolluted, is subject to this qualification, that necessities may arise for an interference with that right pro bono publico, to this extent, that such interference be in respect of a matter essential to the business of life, and be conducted in a reasonable and proper manner, and in a reasonable and proper place.[89]

Hole v. Barlow also raised the issue of whether the concept of reasonableness of location was of universal applicability, or whether some places could be regarded as inherently more reasonable than others for industrial production. The judge argued that it was not a universal concept. He advised the jury that in certain areas, more pollution was acceptable in others, and that, "it is not every body whose enjoyment of life and property is rendered uncomfortable by the carrying on of an offensive or noxious trade in the neighbourhood, that can bring an action."[90] He explained that such an interpretation would effectively shut down whole industrial districts, which could not be allowed to happen. If so,

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[89] *Hole v. Barlow*, [1858], 140 *English Reports*, p. 1118.
[90] *Hole v. Barlow*, p. 1114.

> … the neighbourhood of Birmingham and Wolverhampton and the other great manufacturing towns of England would be full of persons bringing actions for nuisances arising from the carrying on of noxious and offensive trades in their vicinity, to the great injury of the manufacturing and social interests of the community. I apprehend the law to be this, that no action lies for the use, the reasonable use, of a lawful trade in a convenient and proper place, even though some one may suffer annoyance from its being carried on.[91]

Therefore, in this case, the rights of industrialists and the public benefit deriving from industrial production were placed firmly before the rights of those whose property was harmed by the pollution arising from such premises. As environmental lawyer Peter Scott explains, this case famously articulated the notion that, "…activities may be regarded as not being a nuisance because of the perceived inferior character of the neighbourhood in which they take place, and because of the perceived legitimacy of the activity creating the nuisance…" in "its most extreme form".[92]

The pro-industry decision in *Hole v. Barlow* was overturned, however, in the 1862 case *Bamford v. Turnley*. The case also involved the erection of a brick kiln on the defendant's property, which "caused noxious and unwholesome vapours, smokes, fumes, stinks and stenches to raise and proceed from the brick kilns" to the plaintiff's property.[93] It was originally brought before the Court in 1860, at which time the defendant won on the basis of the precedent set by *Hole v. Barlow*. In 1862, upon appeal to the Court of Exchequer, the 1860 decision was deemed erroneous and was reversed. In reversing the earlier judgement, the Exchequer barons first argued that a "convenient and proper place" meant a place in which neighbouring properties would not be harmed. Furthermore, the judges moved beyond property concerns and the rights of industrialists to engage in their business pursuits and mentioned the negative ecological consequences that could be expected to result if *Hole v. Barlow* were allowed to become a legitimate precedent. Baron Bramwell warned that,

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[91] *Hole v. Barlow*, p. 1114.
[92] P. Scott, "Enforcement of Environmental Quality Standards by Individuals", paper presented at the Millennium Law & Humans Conference, 24 November, 2000, p. 10.
[93] *Bamford v. Turnley*, [1862], 122 *English Reports*, p. 25.

> [s]ince the decision of *Hole v. Barlow*, claims have been made to poison and foul rivers, and to burn up and devastate land, on the ground of public benefit. I am aware that case did not decide so much, but I have a difficulty … in saying that what has been so contended for does not follow from the principles enunciated in that case.[94]

Despite their decision to overturn the earlier judgement, the barons of the Exchequer did not completely reject the consideration of the public benefits deriving from the existence of heavy industries articulated in *Hole v. Barlow*. They emphasised that their decision applied to a case in which one property owner harmed the home of a neighbour, but that under other conditions industrial activity might be allowed:

> It may be that for the sake of trade in towns, or for the public benefit, a nuisance is sometimes justified, such as a tallow chandler's factory; but the nuisance in the present case was created by the defendant for a private purpose …[95]

This ambiguity was perpetuated until 1865,[96] when the House of Lords made a definitive pronouncement on the problem of when and where a nuisance stemming from industrial pollution could be deemed legally punishable. In 1863, William Tipping, a homeowner in St. Helen's near Liverpool, which was one of the most heavily industrial areas in England by that time, sued the St. Helen's Smelting Company for emitting noxious vapours that damaged the vegetation on his property and caused sickness among his family members and livestock. The Court decided in favour of Tipping, but explained that the decision regarding the creation of a nuisance had to take into account a wide array of factors. First, they required evidence of tangible damage to the value of property, and that "...the law does not regard trifling inconveniences; every thing must be looked at from a reasonable point of view..."[97] Secondly, the judges declared that the needs of industry also demanded consideration, and thus that, "...in determining that question the time, locality, and all the circumstances should be taken into consideration..."[98] The smelting company appealed the case twice, and finally, in 1865, the House of Lords reaffirmed the original decision.

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[94] *Bamford v. Turnley*, p. 34.
[95] *Bamford v. Turnley*, p. 27.
[96] To give just one example, in early 1863 another case concerning brick making was decided in the same way as *Bamford v. Turnley*, with the judge ordering a verdict for the plaintiff "if there was annoyance to a substantial degree". *Cavey v. Ledbitter* [1863], 143 *English Reports*, p. 187.

In the following year, the reformulation of the concept of reasonableness laid down in *Tipping v. St. Helen's* was echoed in the *Sanitary Act* of 1866. It empowered justices to dismiss nuisance complaints if they were satisfied that a factory's smoke pollution was inevitable given "the nature of the manufacture or trade", and also emphasized the importance of allowing polluting activity that was "necessary for the purposes of the business or manufacture" in question. The same powers were given to local courts by the 1875 *Public Health Act*.

Therefore, the concept of reasonableness with respect to the location of polluting industries evolved from the relatively straightforward rule, found in the case law of the pre-industrial period, requiring that such industries be kept at a safe distance from other types of buildings, to a complicated set of rules distinguishing various level of reasonableness contingent upon the presence or lack of tangible property damage or harm to the public health. The new conception of reasonableness that developed in the case law of this period and that significantly undermined the rigidity and universality of the smoke pollution provisions was then formalized in statutory form. The result was a reformulation of a fundamental aspect of nuisance law in a manner that offered the potential for significant protection from prosecution for polluting firms.

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[97] *Tipping v. St. Helens Smelting Company (Limited)* [1863], 122 *English Reports*, p. 588.
[98] *Tipping v. St. Helens Smelting Company (Limited)*, p. 588.

2.3 Changing responsibilities of industrialists and workers

A striking feature of the legislative developments between 1843 and 1853 was the inclusion in the 1853 *Metropolitan Smoke Abatement Act* of a clause making "the Owner or Occupier of the Premises, or … Foreman or other Person employed by such Owner or Occupier" subject to the penalties laid out in the *Act*. In this way, smoke prohibition law sought to break the intimate connection, under the common law, between nuisance law and land ownership. The responsibility for the emission of smoke pollution came to rest with whoever was most immediately responsible for its creation, without regard to whether those responsible were property owners or hired workers, and the returns of smoke pollution convictions included in the *British Sessional Papers* prior to the passage of the 1875 *Public Health Act* reveal that after 1853, industrial stokers were regularly fined separately from factory owners.[99]

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[99] For example, see *BSP* XXXVI 1875, p. 336, for returns from 1874.

Because the 1875 *Public Health Act* contained a definition of smoke that was borrowed from existing smoke prohibition clauses, it perpetuated this separation of the offence of creating smoke pollution from the ownership of the premises emitting the smoke. Furthermore, section 94 of the Act ordered that the local authority responsible for issuing smoke abatement notices serve such notices to the person most immediately responsible for the creation of the smoke nuisance.[100] Only if that person could not be found was the owner or occupier of the premises to be issued with a notice. This section clearly laid initial responsibility for the creation of smoke pollution with industrial workers. Through an examination of the development of the perceived responsibilities attributed to workers over the course of the nineteenth-century smoke debate, the full meaning of this wording is revealed. This section will discuss that development and the lively debate concerning the responsibilities of industrialists and their employees as England's industrial economy matured and the perceived responsibilities attached to industrial property ownership declined.

In the period 1819-1821, the owners of steam engines tended to be closely involved in their operation. Factories were for the most part small, so that the owners could easily supervise all aspects of their production processes.[101] Factory owners also often lived on or near their industrial premises, and were therefore keenly aware of the effects of smoke pollution. These intimate connections between the owners of the steam engines producing smoke pollution and the creation of the pollution itself helped foster a sense of institutional memory, with sons or other descendants of factory owners often pursuing ideas for curbing industrial smoke emissions after witnessing the challenges faced by their fathers in connection with this environmental problem. Indictment by local authorities or private suits by neighbouring property owners were a continual external threat, while in some cases the pollution harmed other arms of the family's own works or houses located on the same premises. Many of the witnesses before the Select Committees on Steam Engines and Furnaces of 1819 and 1820 had experienced one or both of these problems.

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[100] *Public Health Act*, 1875, 38 & 39 Vict., c. 55, s. 94.

[101] P. S. Bagwell, *Industrial Relations* (London, 1974), p. 70. By contrast, by the mid-nineteenth century, the numbers of middle-level industrial positions began to increase greatly and disproportionately to numbers other industrial workers. In 1881, sociologist Charles Booth traced this change and argued that it indicated "a revolution in the method and management of industry, the effect of which must be far beyond the single fact we are now noticing." C. Booth, "Occupations of the People of the United Kingdom, 1801-81", reprinted in G. Routh, *Occupations of the People of Great Britain, 1801-1981* (London, 1987), p. 6. Richard Tames discusses a similar proliferation of industrial jobs requiring less skill in his *Economy and Society in Nineteenth-Century Britain*

In this early period, if a factory faced indictment or a civil suit for nuisance, it was a well-established aspect of the common law doctrine of nuisance that the factory owner was the person legally responsible for the pollution emitted by his or her works. From its origins, nuisance law required property ownership as a prerequisite to legal action. This legal regime does not appear to have been questioned by either the legislators or the witnesses involved in the 1819 and 1820 Parliamentary committees looking into the smoke problem, nor was it changed with the enactment of the 1821 *Smoke Prohibition Act*. On the contrary, the purpose of

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(London, 1972), p. 141. Great Britain's position as the first industrial society and its early experience with industrial stratification is also cited by several historians as one reason accounting for the country's relative economic decline in the late nineteenth and early twentieth centuries. For example, see S. Pollard, *Britain's Prime and Britain's Decline: The British Economy 1870-1917* (London, 1988), ch. 1 and conclusion; M. W. Kirby, *The Decline of British Economic Power Since 1870* (London, 1981), pp. 7-8.

this Act was to encourage further recourse to common law remedies in order to abate the nuisance caused by industrial smoke emission.

By the mid-nineteenth century, numerous factory owners began to argue that they should not be held responsible for excessive smoke emissions when it was their employees hired to manage their furnaces who caused those emissions to be released. They argued that their employees were often prone to laziness and negligence, and that even when properly trained in the use of smoke abatement equipment often allowed unnecessary smoke pollution. This shifting of blame and responsibility was helped by scientists, engineers, and other experts who began to discredit the stokers, foremen, and other employees who managed furnace fires in treatises on the smoke problem as well as before the Parliamentary committees of the 1840s. Whereas in earlier decades some of these experts had praised the specialised knowledge that furnace managers utilised in their work, this knowledge was gradually dismissed as other areas of specialisation, such as chemistry and mechanical engineering, came to dominate the literature on smoke pollution and its control.

This view of industrial workers had developed quite quickly, since in the earlier decades of industrialization, the specialized knowledge of the factory workers who looked after furnace fires was considered by factory owners to be important and valuable. The role of these workers was discussed before the 1819 and 1820 Select Committees on Steam Engines and Furnaces. At this time, it appeared that the smoke abatement equipment invented by Josiah Parkes would facilitate the work of these workers and would improve the productivity of furnaces adapted to Parkes' plan. For instance, James Spurrell, a brewer at the Barclay and Co. brewery in London stated that with the adoption of Parkes' equipment, "[t]he man who attends the fires has very little to attend to after he has made the fire in the morning, but opening and shutting the dampers." Spurrell added that the fire stokers were also helping to conserve fuel by developing new ways of managing the furnaces. He explained that,

> … we think that there appears, from the short trial that we have had of it, to be a saving of coal; and we are enabled to do more from this mode of firing than ever we did before, for I made particular inquiry this morning, and I found that the men who work at this fire are enabled to blow-off and to steam their casks at the same time, which is a thing they never could do before; that proves that the fire produces more heat.[102]

In 1839, civil engineer Robert Armstrong displayed a similar level of respect for the work done by fire stokers. Armstrong's main argument was smoke burning equipment was largely useless, and he blamed theoretical researchers who ignored the practical expertise of people who worked managing industrial furnace fires. He began his chapter on smoke consumption by stating that, "In nothing has the philosophical manufacturer or amateur mechanic been so much at variance with facts and the experience of practical men as on the subject of *smoke burning*."[103] He then advised that people pay more attention to the practical knowledge of fire managers because they alone were aware of what techniques were required to avoid the creation of excessive industrial smoke:

> The great secret of smoke burning … is now pretty well known to practical smoke burners, and that is, either to make very little (or none) to burn, or otherwise so to dispose of fuel in the furnace, that smoke of

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[102] Report from the Select Committee on Steam Engines and Furnaces: &c. (5 July 1820), *BSP* 1820, II, p. 242.

[103] R. Armstrong, *An Essay on the Boilers of Steam Engines* (London, 1839), p. 27.

> such a quality only is made, as will burn comparatively easily; and in either process the saving in fuel is a point yet unsettled.[104]

Armstrong thus concluded that, "The observations of this class of men are frequently more worthy of regard than inventors of new plans are generally disposed to pay to them."[105]

By 1866, however, Armstrong's view of the value of practical knowledge had changed dramatically. He now referred to their expertise as "prejudices" in his 1866 *Chimneys for Furnaces, Fire-places and Steam Boilers:*

> The prejudices of some of the attendants in London in favour of much stoking and hard firing, which is literally working hard at wasting coal, are difficult to account for, especially when found among persons not notorious for working hard at anything else; but a residence among them of any one whose business is to save fuel, will very soon convince him of the fact.[106]

Several decades later, William Graham echoed these sentiments in a pamphlet he wrote for the Society for the Prevention of Smoke formed in Lancashire on the history of smoke abatement in Lancashire. In it, Graham praised the efforts of Charles Wye Williams, claiming that "Mr. Williams is stated to have been the first person who investigated the subject in a true philosophic manner".[107] Despite the simplicity of Williams' invention, however, Graham pointed out that fire stokers were nonetheless often incapable of using it. He recommended the replacement of workers by machinery designed to feed and stoke furnace fires at a steady rate since "… the facility with which a stoker is able to counteract the best arrangements, suggest the advantage of mechanical feeders."[108]

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[104] Armstrong, *An Essay on the Boilers of Steam Engines*, pp. 29-30.
[105] Armstrong, *An Essay on the Boilers of Steam Engines*, pp. 31-32.
[106] R. Armstrong, *Chimneys for Furnaces, Fire-places and Steam Boilers* (London, 1866), p. 58.
[107] W. Graham, *Smoke Abatement in Lancashire*. (Manchester, 1896), p. 6.

This negative and dismissive view of the abilities of fire managers is especially interesting because at the same time that their knowledge and work habits fell into disrepute, industrialists also began to argue that it was in fact the work of these employees that was most vital in the prevention of smoke and that they should be held legally responsible for excessive smoke emissions. In April, 1845, during a House of Commons debate on one of William Mackinnon's smoke abatement bills, one Member of Parliament questioned the identification of the "owners and occupiers" as those responsible for the pollution emitted from industrial fires: "… the provisions of the Bill had particular reference to the occupiers of chimneys and furnaces. Who were occupiers of chimneys?" Almost identical wording had been successfully included in the 1821 *Smoke Prohibition Act*, which exempted "the Owners or Proprietors of Occupiers of any Furnaces of Steam Engines erected solely for the Purpose of working Mines of different Descriptions …" without any clause defining the terms "owner", "proprietor" or "occupier". By contrast, the bill under discussion in April 1845 contained a detailed definition of "occupier":

> the word "occupier" shall mean the sole person, or any one of several persons in the actual possession of any Chimney, either as owner or owners thereof, in fee-simple, or for any smaller interest, or in case there shall be any difficulty in ascertaining the person or persons in possession, the owner, or any one of several owners, who would be entitled to possession in case the same were unoccupied; unless with respect to any such expressions it shall be otherwise specially provided.

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[108] Graham, *Smoke Abatement in Lancashire*, p. 6.

> or there be something in the subject or context repugnant to such constructions.[109]

The Member's questioning of the meaning of the owner or occupier of an industrial chimney suggests not a genuine lack of understanding of this matter, but rather a desire to question its appropriateness.

An 1852 York Health of Towns Association report on the industrial smoke problem went further than simply critising and dismissing the knowledge and practices of factory workers charged with managing furnace fires. This report portrayed industrialists as victims of their willfully negligent employees and advocated making such workers subject to inspections and fines in the same way that the 1844 bill proposed by William Mackinnon sought to make factory owners subject to penalties for allowing their furnaces to produce excessive smoke emissions:

> Those laws seem very reasonable which inflict a penalty on the proprietor for neglecting to prevent the nuisance *when* practicable: and it has occurred to your committee that as experience has shown how difficult it is for a proprietor (however anxious he may be) to secure the attention of the fireman to his fire, and how wilfully careless this class of men are, it would be advisable to extend legislation to them, by subjecting them to a penalty, as well as the proprietors (who have hitherto been the only parties mentioned in police acts), whenever they allowed smoke to be formed, and it could be proved that it was *practicable* to prevent it.[110]

This view appeared to be common among local authorities. In 1846, a report commissioned by the Earl of Lincoln on behalf of the government to look into several appeals for exemptions from smoke abatement legislation made by various industrial interests. The authors (two prominent scientists) reported that after inquiring in several localities,

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[109] A Bill To prohibit the Nuisance of Smoke from Furnaces or Manufactories. 5 March 1845. *BSP* 1845, VI, s. 2, p. 38.
[110] W. Graham, *Smoke Abatement in Lancashire*. (Manchester, 1896), p. 14.

> In all the towns referred to, complaints were made of the absence of power to inflict a small fine upon the stoker for carelessness in managing any smoke consuming apparatus, or even in stoking ordinary fires. Upon this point the opinion is universally expressed, that all Acts will be inoperative unless the stoker also, as well as the master, be made an interested party in seeing to the due execution of the Act.[111]

Some commentators suggested that employees should be rewarded for exercising additional care when stoking furnace fires, rather than being penalised for allowing smoke pollution to escape into the atmosphere. For example, a letter to the Times pointed out that paying extra wages to careful stokers would cost far less than the installation of smoke abatement equipment:

> Instead of furnace owners in London beginning by altering their furnaces, let them begin by following the Liverpool plan, of an extra 3s. a week to the furnaceman so long as the smoke is self-consumed; very frequent feeding in small quantities, and a reward for no smoke, will cost far less than a great speculative alteration.[112]

However, these ideas were ignored in favour of the more punitive attitude articulated in the 1853 *Metropolitan Smoke Abatement Act*.

In addition to casting aspersion on the abilities of industrial workers who managed furnaces, the experts quoted above helped move the smoke debate away from the concept of smoke "consumption", or eradication, altogether. Instead, in the 1840s several of them began to argue that the goal in question was, in fact, preventing the creation of smoke in the first place rather than its destruction once created. As a result, they began to reject many apparatuses patented for the purposes of smoke consumption, and instead emphasised the importance of careful and knowledgeable fire management in order to prevent the creation of unnecessary smoke. This helped to further erode the responsibilities of factory owners with respect to smoke pollution control, since the problem came to be intimately linked with the role of the stokers and other employees charged with supervising the furnace fires.

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[111] Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 335.
[112] "Smoke Consumption". *The Times*, 8 November, 1853, p. 8, col. F.

Charles Wye Williams, an award-winning patentee of a smoke prevention apparatus, wrote in 1841 that he did not believe any invention designed to consume smoke that had already been created would work:

> When smoke is once produced in a furnace or flue, I believe it to be as difficult or impossible to burn it, so as to convert it to heating purposes, as it would be to convert the smoke issuing from the flame of a candle to the purposes of light; and this assertion I make in the face of so many patents, from so many ingenious men.[113]

Williams advocated his own system of preventing smoke in the first place rather than destroying it, and argued that his chemical expertise made his design superior. He appealed to industrialists to read his work, so that "their eyes will at least be opened to the folly of many of those '*smoke-burning*' expedients which of late years have incumbered the patent list, and induce them to admit, that the lights of chemistry alone can guide them safely in those departments of the arts in which combustion forms a part."[114] Several other authors were similarly dismissive of the concept of destroying smoke, but called for a different solution than Williams. C. J. Richardson claimed that industrialists were aware, before the passage of the 1853

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[113] C. W. Williams, *The Combustion of Coal and the Prevention of Smoke Chemically and Practically Considered* (London, 1841), p. 13.
[114] Williams, *The Combustion of Coal and the Prevention of Smoke Chemically and Practically Considered*, p. 14.

Metropolitan Smoke Abatement Act, that smoke prevention could in fact be achieved through diligent fire management, "… by careful firing only, combined with alterations of a simple and inexpensive kind, chiefly to regulate the admission of air to the flame."[115] Civil engineer Robert Armstrong also called for better firing techniques, and dismissed the concept of "perfect combustion" upon which the notion of smoke prevention was premised (in which the correct admission of additional air at a high enough temperature was supposed to allow all of the carbon in coal fuel to burn, thereby preventing the creation of any sooty smoke containing unburned carbon particles). Instead, Armstrong advocated a system of "best possible combustion", which involved the conversion of the harmful by-products of coal combustion into harmless carbon dioxide and water. His method would require no special equipment, only expert management of the fire:

> … the most economical method of firing a steam engine boiler, from which a constant quantity of steam is required, must be by a regularly uniform supply of fuel to the furnace, and a similarly regular supply of air through the fire-grate 'and no where else,' with a uniform though moderate emission of smoke, visible of invisible, from the chimney…[116]

This new emphasis on the role of employees tending to industrial fires was then introduced to the government through the 1846 report mentioned above. The two scientists asked to write the report investigated the claims of experts such as Charles Wye Williams, C. J. Richardson, did not recommend the installation of smoke abatement equipment, but rather identified the following three main causes of industrial smoke pollution: incorrect construction and size of boilers, inadequate admission of air into furnaces, and "carelessness of stoking and management by those entrusted with the charge of the fire-places and boilers."[117]

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[115] C. J. Richardson, *The Smoke Nuisance, and its Remedy. With Remarks on Liquid Fuel* (London:, 1869), p. 5.
[116] R. Armstrong, *The Modern Practice of Boiler Engineering, revised by J. Bourne* (London, 1856) pp. 119-120.

Therefore, the prevention of industrial furnace smoke gradually came to be seen as preferable to the adoption of expensive equipment designed to consume or destroy smoke, and as experts in industrial furnace technology increasingly advocated careful management of furnaces, the role and responsibilities of stokers and other employees responsible for this task came increasingly under scrutiny. This process ultimately resulted in the inclusion in the 1853 *Metropolitan Smoke Abatement Act* of the clause listing industrial employees as among those liable for the creation of smoke pollution. In this way, scientific development and legal change interacted in an interesting way to undermine the well established common law emphasis on the responsibility of property owners for the negative effects of the activities performed on and with their property.

Another area of law that saw a very similar change in response to changing perceptions of the owner-worker relationship was that of negligence. Philip Bagwell explains that under the common law, employers are considered responsible for the actions of their employees. Prior to the onset of industrialization and the development of the factory system, such law was relatively easy to enforce since masters and their servants generally worked closely together. With industrialization, factories grew larger and their owners began to hire managers, with the result that, "…the responsibility of the master for the safety of those he employed could not be so directly exercised."[118]

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[117] Report, addressed to Viscount Canning, &c. By Sir Henry Thomas de la Beche and Dr. Lyon Playfair, upon the Means of obviating the Evils arising from the Smoke occasioned by Factories and other Works situated in large Towns. 6 April 1846. *BSP* 1846, XLIII, p. 333.

This changing reality with respect to the relations between industrial owners and workers was formalised in an 1837 civil case, *Priestly v. Fowler.*[119] In the case, an employee of a butcher was asked to accompany a cart belonging to the butcher. The cart was overloaded, however, and the plaintiff was injured when an accident occurred. As Bagwell notes, the decision in this case was without precedent, as was the judgement of the House of Lords in *Tipping v. St. Helen's*. Instead of relying on legal precedents and established authorities, the judges chose to base their decision on "general principles".[120] They decided in favour of the butcher, because "[i]f the master be liable to the servant in this action, the principle of that liability will be found to carry us to an alarming extent."[121] The judges asserted that, "the mere relation of the master and the servant never can imply an obligation on the part of the master to take more care of the servant than he may reasonably be expected to do of himself." Furthermore, it was the duty of workers to diligently protect the interests of their employers, for, as the judges concluded, "…to allow this sort of action to prevail would be an encouragement to the servant to omit that diligence and caution which he is in duty bound to exercise on the behalf of his master…"[122] This unprecedented decision was affirmed in 1850, in a case in which a railway worker, Hutchinson, was killed while riding on one train that was hit by another train, both of which were owned by his employer.[123] The judges in this case further articulated the new conception of the responsibilities of industrial owners with respect to their workers, asserting that an injury caused to one worker by another worker could not be made the responsibility of their master. Despite the fact that the train was "violently driven" so that Hutchinson "was greatly cut, crushed, and wounded, and of the said cuts, crushes, and wounds died" and left behind a wife and several children, the judges argued that Hutchison took on such risk when he entered into his employment contract:

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[118] P. S. Bagwell, *Industrial Relations* (London, 1974), p. 70.
[119] Bagwell, *Industrial Relations*, p. 70.
[120] *Priestley v. Fowler* [1837], 150 *English Reports*, p. 1032.
[121] *Priestley v. Fowler*, p. 1032.
[122] *Priestley v. Fowler*, p. 1033.

> He knew, when he engaged in the service, that he was exposed to the risk of injury, not only from his own want of skill or care, but also from the want of it on the part of his fellow-servant; and he must be supposed to have contracted on the terms that, as between himself and his master, he would run this risk.[124]

In this way, workers were divested of the legal protections afforded to passengers traveling on the same trains and fully exposed to the risks involved in heavy industrial work, and the owners of the trains relieved of legal responsibility for injuries to their workers not caused directly by the owners themselves, which amounted to far-reaching protection of the owners. The similarities between this development and the smoke provisions attributing responsibility for a factory's pollution to the workers most immediately responsible for its creation are striking, and suggest a reformulation of the relationship between industrial owners and workers, in a manner favouring owners and detrimental to workers and the environment.

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[123] Bagwell, *Industrial Relations*, p. 71.

[124] *Hutchinson, Administratrix of Joseph Hutchinson, Deceased v. The York, Newcastle, and Berwick Railway Company* [1850], 155 *English Reports*, p. 155.

Conclusion

The 1875 *Public Health Act* constituted a crucial step in the history of English public health improvement. Many historians argue that its passage marked the first meaningful attempt to curb the severe smoke pollution accompanying industrialization and urbanization. However, with respect to industrial smoke, the 1875 Act's provisions were unimpressive, in particular when compared with legislative attempts made in earlier decades. The disappointing nature of the 1875 smoke clauses can be explained by the fact that they were created through a melding of different kinds of legislation and of various changing conceptions regarding the nature of industrialization and the roles and responsibilities of those involved in industrial enterprises.

To begin with, failure in the 1840s and early 1850s to enact a definitive national anti-smoke Act led to a proliferation of smoke prohibition clauses in different kinds of legislation. As such clauses were enacted, their wording gained in complexity and inconsistency. Thus, both the places subject to smoke prohibitions and the details of each smoke clause became increasingly confused. Secondly, the drafters of the 1875 provisions turned to nuisance removal and public health law in addition to earlier smoke abatement legislation. They retained a definition of industrial smoke very similar to earlier anti-smoke legislation. However, they incorporated this definition into a markedly different legislative context. Drawing on nuisance removal law, they deemed smoke a nuisance, rather than a prohibited offence. With this conception of smoke pollution as a nuisance, they included reactive enforcement procedures, to be undertaken only once a nuisance was created. This melding of smoke abatement law with nuisance removal law occurred with the passage of the *Sanitary Act* of 1866 (a public health Act). With the 1866 Act, public health legislation adopted nuisance removal provisions from earlier nuisance removal law, and then incorporated industrial smoke pollution into them. Thus, smoke pollution was no longer treated as a unique offence. In this way, the 1875 smoke provisions lost both the prohibitive character and the uniqueness ascribed to industrial smoke pollution found in earlier smoke abatement legislation.

In addition to their legislative origins, the 1875 *Public Health Act*'s smoke provisions suffered from the reinterpretation of several concepts that had long been crucial to both statutory and common law smoke law. The concepts of the "best practicable means" and "reasonableness" with respect to the nature, location and extent of industrial activities were gradually reconceptualized in a manner favourable to industrial owners, to the detriment of both their workers and the environment.

Overall, the result of the convergence of these factors was the creation of a body of smoke law that was regressive in several significant ways. The attempts of earlier decades to enact more robust and proactive smoke pollution law were not realized. Instead, the 1875 *Public Health Act* smoke provisions marked the consolidation of English smoke pollution law in a reactive form that remains visible in the smoke law presently in force.

Conclusion: The Quest for a National Smoke Pollution Law

The view of English smoke pollution law in the nineteenth century commonly presented in the historiographical literature is one of more than a half-century of insignificant or inadequate measures that accomplished little if anything in terms of pollution control. These piecemeal attempts at regulation were finally superceded by the smoke provisions incorporated in the 1875 *Public Health Act*. The 1875 smoke provisions are characterized as the first comprehensive and meaningful attempts to regulate industrial smoke pollution. In contrast, this thesis argues that when viewed in comparison with the various attempts at regulating smoke pollution made prior to 1875, the 1875 *Public Health Act* smoke provisions can be seen to have lacked much of the potential strength of earlier industrial smoke pollution law. In many ways, these strengths have never been regained.

This thesis has thus offered a new interpretation of the 1875 *Public Health Act* with respect to industrial smoke pollution law. This new interpretation, in turn, rests upon a new reading of the protracted nineteenth-century smoke debate that preceded its enactment. To this end, the thesis has provided a fuller picture of the development of English smoke pollution law in the industrial revolution period than is commonly presented in the existing literature. This was accomplished by examining an extended chronological period and a wider variety of legal means used to combat excessive industrial smoke emissions over the nineteenth century.

The nineteenth-century smoke debate involved several attempts to combat industrial smoke pollution, through varying legal means. This thesis examines these diverse initiatives in their respective historical contexts, and it demonstrates that the 1875 provisions drew upon these earlier initiatives yet also departed from them in several significant ways. Chapter One begins by introducing common law nuisance, the body of law used to combat pollution problems prior to the nineteenth century. Common law nuisance involved legal actions taken against polluters by those affected by the pollution, whether a specific landowner or local authorities on behalf of the public as a whole. This form of legal action had been used for centuries to adjudicate a wide variety of nuisances, many of them pertaining to matters that would be deemed environmental today. In the early nineteenth century, nuisance law was drawn upon to combat industrial smoke pollution in the first decades of the industrial revolution.

In the mid-nineteenth century, legislators argued that the common law approach to industrial smoke pollution had become outmoded and unworkable. Ever since, this negative view of nuisance law in the early nineteenth century has been adopted by historians and legal scholars alike. However, the local evidence examined in Chapters One and Two reveal that this form of action could be successful, both in punishing polluters and serving as a deterrent to many industrialists. Chapter Two also emphasises the fact that a group of prominent industrialists played a crucial role in creating the first national smoke pollution law, the 1821 *Smoke Prohibition Act*. In their testimony on the smoke problem before the parliamentary Committees of 1819 and 1820, almost all of these men indicated that they had faced either indictment or civil suits for a pollution nuisance, or the threat of such action. This had motivated several of them to develop improvements to their steam engines, furnaces and other machinery. At the same time, they widely believed that such improvements, by contributing to significant savings in coal fuel, would be worthwhile economically. This spirit of optimism and willingness to voluntarily create and adopt mechanical improvements was crucial to the success of the 1821 *Smoke Prohibition Act.* It also contrasts markedly with attitudes displayed by industrialists later in the nineteenth century.

Many historians criticize the 1821 Act for its failure to provide additional legal redress, beyond the nuisance actions and remedies available through the common law, to those seeking to prosecute industrial polluters. However, when viewed in light of the findings of Chapter One, it does not seem reasonable to characterize as obsolete and inherently unworkable an Act upholding common law nuisance procedures at a time when these were frequently used against industrial polluters and was perceived to be relatively effective.

In the years immediately following the passage of the 1821 *Smoke Prohibition Act*, nuisance prosecutions were undertaken in some localities in greatly increased numbers. As industrialization progressed, however, and the number and size of polluting factories increased along with the importance of manufacturing to the English economy, such actions declined and the 1821 Act became increasingly difficult to enforce. Chapter Three investigates this decline, which led to the commentaries of the mid-nineteenth century refuting the adequacy of the common law remedies available for pollution problems, that are drawn upon by many historians. In this chapter, the changing status of the Courts of Quarter Session, the primary venue for public nuisance actions, is traced between the 1820s and 1850s. In these decades, the rapid urbanization accompanying industrialization led the government to introduce far-reaching changes in local government administration. By the late 1830s, the local authorities, such as constables and inspectors, who were responsible for prosecuting nuisances lost many of their powers as new town councils were formed and committees convened to deal with pollution and other public health problems. Thus, the administrative changes of the early nineteenth century, in particular the loss of a key venue for the enforcement of environmental standards that occurred with the decline of the Quarter Sessions, played an important role in the decreasing efficacy of common law nuisance in the fight against industrial smoke pollution.

Chapter Three also reveals that in the years of adjustment following these changes, many localities turned to local legislation to introduce anti-smoke pollution provisions. They drew upon local improvement Acts, Acts of Parliament of local applicability which often contained hundreds of clauses relating to urban improvement, sanitation and environmental requirements, to secure the enactment of statutory smoke provisions. Such provisions took the form of a smoke prohibition, in which industrial steam engine and furnace owners were required to alter their machinery so that it consumed, or burned, the smoke it generated. These were the first instances of statutory smoke prohibitions, and they constituted a notable departure from common law nuisance provisions. They were prohibitory in nature, deeming excessive smoke emission an offence regardless of its provable effects. Thus, their stipulations were separated from property ownership requirements or the necessity of proving the negative effects of pollution on the public's health, both of which were essential elements of nuisance under the common law.

The smoke prohibitions written into several local improvement Acts between the 1820s and 1840s served as a model for legislators in the 1840s who sought to replace the 1821 *Smoke Prohibition Act* with a new, compulsory smoke pollution law. By the early 1840s, the problems outlined in Chapter Three relating to the enforcement of the 1821 Act and the weakening powers of local authorities to take action against industrial polluters had reached national prominence. Chapter Four describes the growing level of public support for a new smoke law, in which industrial smoke pollution would be defined more strictly than it was under the common law. The bills proposed throughout the 1840s closely resembled the local improvement Acts in focusing narrowly on the offence of emitting smoke rather than on the effects thereof. In particular, the newly emerging public health movement lent much support to the anti-smoke cause. With the support of the movement's leaders, a smoke prohibition clause was included in a draft bill of the 1848 *Public Health Act*, although not surviving into the final version of the law.

The influence of the public health movement on the smoke debate helped greatly to bring the issue of smoke pollution to national prominence in the mid-nineteenth century. However, the adoption of the smoke cause by the public health movement also had negative consequences. By the later nineteenth century, public health law, nuisance removal law, and smoke abatement law merged in the creation of the 1875 *Public Health Act* smoke provisions. As a result, while the 1875 provisions did indeed mark the enactment of national smoke law of a more compulsory nature than the 1821 *Smoke Prohibition Act*, they no longer contained a general smoke prohibition. The legislators of the 1870s adopted a form of statutory nuisance that no longer imposed a prohibitive ban on excessive smoke emissions. Instead, smoke emitted from industrial furnaces and chimneys had to be declared a nuisance by an appropriate local official and a nuisance abatement notice served to the polluter before punitive legal action could be taken. Thus, the 1875 provisions allowed for delayed remedial action to be taken in the wake of the creation of smoke pollution by industrialists. In addition, the inclusion of smoke pollution provisions in the 1875 *Public Health Act*, rather than the creation of a new law exclusively devoted to smoke (as the 1821 *Smoke Prohibition Act* had been) marked the end of the successive earlier attempts to isolate industrial smoke emissions as a distinct form of pollution requiring a particular form of regulation.

In addition to the new conception of smoke pollution and its regulation embodied in the 1875 *Public Health Act*, the Act's smoke provisions contained familiar clauses that were reinterpreted in a manner that protected both polluters and industrialists. First, the the ability to escape punishment for smoke pollution offences increased through the evolution of the "best practicable means" test into an exculpatory clause offering protection from prosecution. Finally, the rights and responsibilities of industrial owners and workers were altered in a manner that heavily favoured owners. As noted above, the smoke prohibition clauses enacted in the mid-nineteenth century had separated the smoke law from the requirement of property ownership and no longer required that the negative effects of smoke pollution be proven. This was intended to make the law stricter; however, by the later nineteenth century it contributed to a redistribution of responsibility for the creation of industrial smoke pollution. The legal responsibilities of property ownership were shifted to workers, as liability for the creation of industrial pollution was declared to lie with whoever was most immediately responsible for the creation of such pollution, rather than with the owner of the machinery emitting excessive smoke.

When seen in this light, and alongside the numerous earlier attempts to combat the smoke problem inspired by several proactive approaches to the issue, the 1875 *Public Health Act* smoke provisions appear highly conservative, falling far short of the possibilities envisioned in earlier decades. Thus, while the importance of the *Public Health Act* in 1875 as a milestone in public health improvement is beyond dispute, the approach taken in the Act to industrial smoke pollution was regressive and the problematic nature of its smoke provisions continues to plague much existing pollution law.

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